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MILITARY MEDICINE

(Formerly THE MILITARY SURGEON)

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MILITARY MEDICINE

ORIGINAL ARTICLES

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Epidemiological Approach to Heat Trauma*

By

MAJOR EDGAR L. COOK, M.C., U. S. ARMY†

(With two Charts)

PREVENTION of trauma is becoming one of the important mass health problems of modern armies. The effect of epidemics of infectious diseases which have rendered whole armies ineffective has been well documented in history. However, due to advances in prevention and treatment of infectious diseases the problem of trauma has emerged to the point where it demands the attention of all military surgeons. Participation in this field with the same enthusiasm and vigor which has been so successful in the field of communicable disease will bring similar results to the control of trauma. Although there are no pathogenic organisms, arthropod vectors, or vaccines in this field the same basic principles of epidemiology so successful in the field of communicable diseases can be applied to trauma. Gordon¹ and Press² have clarified the epidemiological approach to trauma as a mass health problem. Trauma due to environmental temperature extremes constitutes a special type of trauma of importance to the military services. Whayne³ described the host-agent-environment com-

plex in his analysis of cold injury during World War II. During the Korean conflict Schuman⁴ made an epidemiological study of cold injury during the winter of 1951-1952. At the other end of the temperature gradient there are heatstroke and heat exhaustion which may result in death or disability. The purpose of this article is to describe the application of epidemiological principles to the development of programs for the prevention of heat trauma. In order to do this some information gathered in a study conducted by the Army during the summer of 1954 in nine selected Army camps with a total mean military population of approximately 240,000 troops will be utilized. Included in this total was a mean strength of 72,000 basic trainees.

The major problem pertaining to cold injuries is in combat areas and involves the combat rifleman. The problem of injuries associated with high environmental temperatures in the Army during World War II was mainly in the United States. The death rate, per 100,000 per annum, due to the effects of heat, excluding burns, in the continental United States was four times the rate outside the country. Using the next severest index, the admission rate for heatstroke (sunstroke) per 1,000 per annum, the rate in the United States was three times the rate outside the country. Monthly admission rates for the

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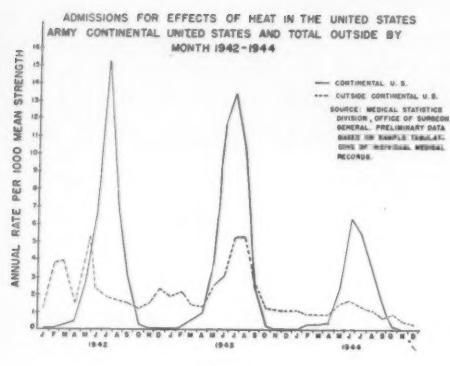


FIG. 1.

effects of heat for the years 1942-1944 both in and outside the continental United States are presented in Figure 1 and Table 1, and reveal the seasonal cycle within the country and a comparison with the rates outside the country.

During World War II, in addition to the excellent work on the physiology of man in hot environments, several studies were made at individual posts. Wallace⁵ reported 99 cases of heat injury at Keesler Field, Mississippi. Borden, Waddill and Grier⁶ made a statistical study of 265 cases of heat disease at Ft. Eustis, Virginia, during the summer of

1943. A clinico-pathologic study by Malamud, Haymaker and Custer⁷ was reported of 125 cases of fatal heatstroke from the clinical records, autopsy protocols together with fixed tissues and stained sections. Schickele⁸ made an analysis of the environment in relation to fatal heatstroke using the clinical records of 157 cases and weather data secured through the cooperation of the Army Air Forces.

In order to define the problem of heat injury in the Army at the present time, and evaluate the use of a modified effective temperature index in limiting the activities of troops, a study was conducted in nine selected Army camps during the summer of 1954. Three camps without basic training activities were included. These were Ft. Meade, Maryland; Ft. Benning, Georgia; and Ft. Riley, Kansas. The six camps having basic training activities were Ft. Lee, Virginia; Ft. Jackson, South Carolina; Camp Gordon, Georgia; Camp Chaffee, Arkansas; Ft. Knox, Kentucky; and Ft. Leonard Wood, Missouri. Each camp was directed to complete a standard questionnaire on all cases of heatstroke and heat exhaustion brought to the hospital. In addition, each post collected wet bulb and globe temperature readings at 0800, 1000, 1200, 1400 and 1600 hours. These data were

TABLE 1

ADMISSION RATES PER 1000 PER ANNUM FOR EFFECTS OF HEAT (EXCEPT BURNS), UNITED STATES ARMY, CONTINENTAL U. S. AND TOTAL OUTSIDE, BY MONTH, 1942-1944

Month	Continental U. S.			Outside Continental U. S.		
	1942	1943	1944	1942	1943	1944
January	.04	.08	.01	1.32	1.95	1.09
February	.01	.17	.28	3.75	2.08	.87
March	.28	.59	.34	3.89	1.41	.89
April	.57	.95	.48	1.50	1.29	.87
May	2.67	3.93	2.31	5.29	2.40	1.48
June	6.88	11.58	6.25	2.30	3.08	1.64
July	15.53	13.60	5.38	1.92	5.20	1.29
August	7.12	10.10	3.73	1.63	5.20	1.05
September	2.76	2.27	1.44	1.54	2.58	.60
October	.35	.22	.08	1.21	1.24	.90
November	.09	.04	.02	1.51	1.09	.54
December	.05	.07	0	2.30	1.09	.31

Preliminary data based on sample tabulations of individual medical records.

Source: Medical Statistics Division, Office of The Surgeon General, Department of the Army.

collected at most posts by the preventive medicine personnel. Although there was considerable variation in the heat trauma prevention program at different posts, no effort was made to standardize the programs.

During the summer of 1954, 2001 heat trauma questionnaires were submitted by the posts. These revealed the importance of the problem in camps with basic trainees. The incidence during the month of July 1954, the peak month, in six camps where reporting procedures could be considered comparable is presented in Figure 2 and Table 2. Ft. Benning and Ft. Riley without basic trainees had very low rates. The other camps had high basic trainee rates. There were 20 cases of heatstroke including one death. One individual developed severe neurological changes which will necessitate his discharge from the service. The other 18 cases recovered without sequelae. As all 20 cases were basic trainees, these 18 will be in the Army during the summer of 1955, and an attempt will be made to follow their activities at that time. These cases of heat-stroke will be considered in the discussion of the agent-host-environment complex. The remaining cases of heat exhaustion will be presented at a later date.

Host factors are important in heat-stroke. Of the twenty cases of heat-stroke, seven, or 35%, were overweight according to Army standards for officers. One trainee, who was 51 pounds overweight was waiting for a medical discharge because of obesity and

TABLE 2
HEAT TRAUMA (HEAT-STROKE AND EXHAUSTION)
INCIDENCE RATES BASIC TRAINEES AND OTHER
MILITARY PERSONNEL
SIX ARMY POSTS
JULY 1954

Post	Incidence Rate Per 1000 Per Annum	
	Basic Trainees	Other Military Personnel
Ft. Benning	No basic trainees	15.9
Ft. Riley	No basic trainees	13.3
Ft. Jackson	64.2	22.0
Camp Gordon	91.4	26.2
Ft. Leonard Wood	221.5	12.0
Camp Chaffee	295.7	21.0

Source: Individual Heat Trauma Questionnaires Submitted by Posts.

bronchitis. The individual who died was 59 pounds overweight. The problem of obesity in heat injury stems from the increased demand on the heart and the extra insulation provided by the capillary-poor fat tissue. Also, since metabolic heat is produced proportionately to the bulk of tissue, and is lost proportionately to surface area, a large volume-to-area ratio is a liability in a hot environment. Schickele⁸ found a significant increase in susceptibility to death in overweight individuals.

The physiologic state in relation to salt and water has received considerable attention and has been reported in detail in medical literature. Exact salt and water consumption of the 20 cases of heat-stroke is not known, but the questionnaires did not reveal any evidence of water restriction. There were several local epidemics of heat exhaustion where in individual units water restriction was a factor. When several cases were reported in a single outfit immediate corrective action was taken by the local preventive medicine officer. At one camp the Lyster bag in a bivouac area was not filled and the trainees had to march a considerable distance on a limited supply of water, and there were several cases of heat exhaustion. A cardinal principle to remem-

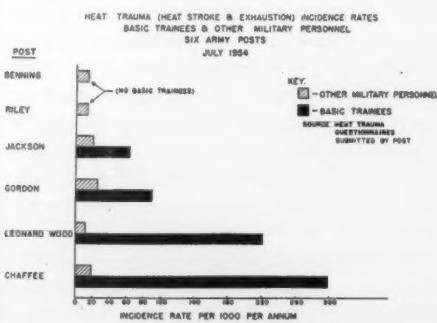


FIG. 2.

ber is that water is an hour-to-hour requirement and salt is a day-to-day requirement. All posts used impregnated salt tablets and there were no reported cases of gastric irritation. In order to encourage the consumption of water, one post cooled the water in the Lyster bag with ice. This same post provided fruit juice in the mid-morning at locations such as the rifle range where trainees were exposed to solar radiation for long periods.

In a hot environment, evaporation of sweat is the main avenue for heat loss, and any change in the sweating mechanism resulting in a reduction can cause a considerable increase in the heat load of the body. In the cases of heat-stroke, fourteen, or 70%, noticed a change. One trainee stated that he was sweating more than usual, and two trainees did not elaborate. Eleven stated that they had noticed a decrease or had stopped, and in many cases the observation was made several hours before the individual became incapacitated.

Age is a factor in heat-stroke in the civilian population, with children under one and elderly people having higher incidence rates. Of the 44 cases of heat-stroke reported by Ferris, Blankenhorn, Robinson and Cullen,⁹ only seven were under fifty years of age and most were in the 60 to 70 age group. The ages of the 20 trainees in the 1954 study ranged from 19 years to 27 years, with an average of 22.6 years. This is a younger age distribution than the distribution of the 125 fatal cases reported by Malamud, Haymaker and Custer,⁷ but probably represents the younger age distribution of the trainees.

All cases of heat-stroke were male and all were white. Sex and race differences in tolerance to heat are difficult to evaluate. It is the opinion of Lee¹⁰ that the differences in sex tolerance to heat can probably be attributed to activity, clothing and/or social adjustment, and while much has been written about racial differences in heat tolerance there is very little factual evidence on which to base a discussion.

The resistance of the individual may be

modified by the state of his health. Three of the twenty had vomiting the day of onset and five stated they had not eaten all of their meals the day of onset. Although episodes of heavy drinking prior to onset have been reported in civilian cases, only one individual gave a history of alcoholic consumption and he had a quart of beer the evening prior to the day of onset. Four of the heat-stroke cases gave a history of previous heat trauma. One had sunstroke in 1948, another had exhaustion in 1952 and the third had heat difficulty in 1951. The individual who died had dizzy spells during the summer of 1953 in Minnesota. Individuals with fibrocystic disease of the pancreas are prone to develop heat exhaustion during periods of hot weather according to Kessler and Andersen.¹¹ In hot weather the abnormally high electrolyte levels in the sweat leads to massive salt depletion. In a study by diSant'Agnese, Darling, Perera, and Shea,¹² several family members of known patients with cystic fibrosis of the pancreas were found to have sweat electrolyte abnormalities similar to those described in the patients and leads to speculation as to the existence of incomplete forms of the disease.

Acclimatization to heat occurs, although it is a gradual process requiring from one to three weeks. The rate of acclimatization varies with individuals and is difficult to measure except under the conditions of a controlled experiment. During this period the work load should be increased gradually. One half, or ten, of the heat-stroke cases had been in camp two weeks or less and the others ranged from two weeks to two months.

Although environmental heat is the agent factor, it is modified by humidity, air movement and radiation. The study during the summer of 1954 revealed many variations in the climatic environment at different posts. Many posts have had arbitrary temperature limits for modifying training which have been used in the past but Heffernon, Hinter, and Kocis¹³ reported the first use of effective temperature as an index for the limitation of troop activity at Ft. Lee, Virginia, during the

summer of 1952. The effective temperature does not incorporate solar radiation which may add to the heat load of troops in the open. During the summer of 1954 a modified effective temperature which incorporated the radiation factor was used at the selected camps by adding 0.3 of the globe temperature to 0.7 of the wet bulb temperature. These temperatures can be recorded without difficulty by post personnel.

Based on experience during the summer of 1954 in nine Army camps, no single limiting factor for modified effective temperature for use in all camps can be given at the present time because of the many variables involved.

Certain environmental factors are amenable to modification. There are certain areas on a post where the trainee may be on the ground for considerable periods of time in a microclimate which may be 10-20 degrees F. above the temperature levels at four to six feet above the ground. These are the preliminary Rifle Circle, where three cases of heat-stroke occurred; the rifle range, where another three cases occurred; and the infiltration course. At one camp there were many cases at the infiltration course late in the afternoon. The hour of going through the course was changed to early morning when the ground was cool, and after this change there were no cases of heat exhaustion. At another camp the preliminary rifle circle was moved from an open area to a shaded grove with a resultant decrease in the number of cases.

Clothing may greatly affect an individual's ability to lose heat. In most instances the trainee was in fatigue uniform but this was modified in some cases by equipment. At one camp the trainee was permitted to remove his fatigue jacket during the noon meal. At another camp a large number of heat exhaustion cases occurred during a division review where all the trainees were in full uniform with field equipment.

Housing is another environmental factor in training camps. Due to the type of barracks, the inside temperatures may be very high until late in the evening, thus interfer-

ing with sleep. In the 20 heat-stroke cases the hours of sleep during the night prior to onset ranged from four to nine with an average of six.

The geographical factor is present in the movement of the trainee from a cool home climate to a much warmer post climate. Nineteen of the twenty heat-stroke cases were from Camp Chaffee, Arkansas, and Ft. Leonard Wood, Missouri. These camps had a high incidence of heat trauma and were both receiving basic trainees from northern states. All of the twenty basic trainees were from northern states; seven from Illinois, six from Michigan, and one each from Minnesota, Wisconsin, Ohio, Pennsylvania, Missouri, Kansas and Iowa. Thus, the location at onset of these cases of heat-stroke, in relation to place of entry into the service, follows a pattern similar to that of the 157 cases of death during World War II, analyzed by Schickel.⁸

SUMMARY

In summary, it may be stated that from a study conducted by the Army in nine selected camps during the summer of 1954:

1. The major problem of heat trauma is in camps with basic trainees.
2. Twenty cases of heat-stroke occurred, including one death in this population under observation.
3. No single limiting figure for modified effective temperature for use in all camps can be given at the present time because of the many variables involved.
4. Heat trauma may be approached epidemiologically. Causation needs to be explained, not in the limited sense of the direct agent, but through consideration of the multiple factors inherent in the host, agent and the environment. The control program depends on determining the factors of the host-agent-environment complex at each post.
5. *Control of heat trauma is a command problem. The post surgeon and preventive medicine officer can develop an excellent preventive program, but the success of such a program rests with command.*

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A fellowship program to stimulate interest in research among medical school students has been announced by the Tobacco Industry Research Committee. The fellowships are intended for regular or graduate students interested in devoting their summer or "off-Term" time to basic research in experimental or clinical sciences. Each fellowship will provide \$500 for the term. The deans of the medical schools will pass on all applicants.

Prevention of Heat Incapacitation in the Armed Forces*

By

SURGEON COMMANDER F. P. ELLIS, Royal Navy**

HEAT incapacitation is usually preventable, because some or all of the causes—excessive warmth, hard work, unsuitable clothing and dehydration—can either be controlled within acceptable limits or avoided altogether.

For many tasks the body is only about 20% mechanically efficient. The other 80% of the energy evolved by metabolism is expended in the form of heat. The harder a man works the more heat he must eliminate by convection, radiation or conduction. But when these paths for heat loss are inadequate, or when the temperature of the air and surroundings exceed the skin temperature so that the direction of heat flow is reversed, he must rely on evaporative cooling. This can only take place if he is sweating, if the surrounding air is not saturated and if the vapour pressure of the air is less than the vapour pressure at the surface of his skin. Sweat contains salt; and salt and water deprivation will result unless heavy sweat losses are made good.

Evaporative cooling and convective cooling or heating, depending on whether the air temperature is less or greater than the skin temperature, are accelerated by brisk air currents and by wearing the minimum. They are retarded by reducing air movement and by increasing the weight, coverage, impermeability or numbers of layers of clothing. Clothing will protect against the absorption of radiant heat from the sun or from indoor surroundings which are warmer than the body; but interference with the evaporation of sweat may offset this beneficial effect.

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** British Joint Services Mission, 1910 K St., N.W., Washington, D.C.; Lately Director, Medical Research Council's Royal Navy Tropical Research Unit.

Dark clothing will absorb more radiant heat than white clothing. Shade will also protect against solar radiation and reduce sweating, but it will not interfere with evaporative cooling. It became fashionable during World War II to decry the value of the time-honoured sun helmet; but the experimental evidence (Winslow and Herrington, 1949; Adolph, 1949) and practical experience (Morton, 1944) both support the use of ventilated or insulated headgear with a broad brim when really severe solar radiation must be endured.

A reduced ability to sweat following prickly heat may aggravate fatigue or predispose to acute heat incapacitation, and so may suppression of sweating from other causes (Wolkin, Goodman and Kelley, 1944; Ladell, Waterlow and Hudson, 1944; O'Brien, 1947; Horne and Mole, 1951). Acute sunburn limits the output of sweat and reduces heat tolerance; and the relatively rare deficiencies or absence of sweat glands should not be forgotten (McQuaide, 1944). There is no evidence that a well-tanned skin protects a man against excessive warmth; but it will help him to work stripped to the waist in the open without becoming acutely sunburnt so that he can gain the benefit of increased evaporative cooling.

Lack of acclimatization is important during the first few weeks when a man commences to work in a warm atmosphere, and particularly during the first few days. It is not always easy to dissociate the effect of training, or of learning to live in a warm climate, from acclimatization; and unacclimatized raw recruits from schools or universities are likely to succumb before unacclimatized but well-trained soldiers and sailors.

INCIDENCE

The official records rarely indicate the true incidence of heat illnesses in the Armed

Forces, for incapacitation is often a transient affair in healthy adult men; but they do provide a useful guide to the areas where the problem is most serious. During the Japanese campaign the incidence in the British forces reached alarming proportions at times for a "preventable" disease. In India during the hot summer of 1942, 1,959 men were admitted to Army hospitals suffering from the effects of heat, and 136 died (Marriott, 1950). Salt and water deprivation (heat exhaustion) accounted for 1,660 cases and 40 deaths, and overheating from cessation of sweating (heat stroke) for only 299 cases but for 98 deaths. Heat exhaustion also accounted for most of the heat illness in the Royal Navy (McLean, 1943; Stenning, 1945; Thomson, 1946). When a large part of the British Fleet was transferred to tropical waters in 1944 the case incidence on the sick list and attending list in the ships was about 5000/100,000/year (0.42/100 man-months); and this represented only part of the problem. Under the thermal conditions prevailing between decks, unreported heat effects and a general lowering in efficiency probably had a more serious impact on the Fleet (Ellis, 1947, 1948, 1952a, 1953a).

The records of cases admitted to the sick list indicate that acute heat illnesses, including heat exhaustion (heat prostration), heat stroke (or sun stroke) and heat cramps, raised more serious problems in the United States Army than in the Navy and the Marine Corps during World War II. The total annual admission rate per 100,000 per year in the Navy and Marine Corps never exceeded 60, whilst in the Army it ranged upwards from 60-250 and exceeded 2,000 in the Middle East in 1943. Between 1942 and 1951 the Army incidence for heat exhaustion was approximately 10 times that for heat stroke, but deaths due to heat stroke were about 5 times as numerous as deaths due to heat exhaustion, which underlines the need for prompt and correct treatment when failure of sweating and polyuria are followed by a rapidly mounting temperature.

The combined figures for 1951 and 1952

TABLE I

ACUTE HEAT INCAPACITATION IN THE UNITED STATES ARMY, NAVY AND MARINE CORPS: 1951-1952, EXPRESSED AS ADMISSIONS: 100,000: YEAR

		Heat Exhaustion (Including Heat Cramps and Heat Prostration)	Heat Stroke (Including Sun-stroke)
Total	Army	83	4
	Navy	20	1
	Marines	162	5
Within the U.S.A.	Army	123	6
	Navy	17	1
	Marines	198	7
Outside the U.S.A.	Army	30	2
	Navy	21	1
	Marines	45	0

pin down the major incidence to Army and Marine Corps Forces stationed within the United States of America; and reveal that heat stroke is reported only very occasionally (Table I). The wide discrepancy between the mild experience of the Navy and the higher incidence in the Marines and the Army at home is probably due in part to the more northerly situation of the naval training establishments and in part to the more strenuous work and heavier clothing and equipment of the marines and the soldiers, the intense solar radiation to which they may be exposed when under training in some areas, the sudden changes in climate which may occur when the clothing and type of work are not changed, the widely differing areas from which recruits are drawn, and the vigorous nature of the training. The differences between the Marines and the Army may be because the ratio of combatant troops to total strength is greater in the Marines who are "supported" to some extent by the Navy.

The diversity of terms in common usage for describing acute heat illnesses does not assist a clear understanding of this problem. Acute heat incapacitation, as it is most fre-

quently observed, is due to the cumulative and varied effects of a rising body temperature, salt or water deprivation or both, fatigue and insufficiency of the circulation—caused by peripheral vasodilatation, pooling of blood in dependent extremities, dehydration or the vasovagal reflex. These are straightforward and related manifestations of the body's inability to adapt to an environment which is too warm. They should not be regarded as separate clinical entities. When partial or complete failure of sweating complicates this relatively simple picture, the essential background is the same, although the emphasis in management may be different. Thus, in their classical wartime study at Shaiba, in Iraq, Ladell, Waterlow and Hudson (1944) observed that men with uncomplicated salt-deficiency dehydration (type I heat exhaustion), heat exhaustion with diminished sweating (type II heat exhaustion) or heat hyperpyrexia, were usually salt deficient; but whereas the first group were dehydrated, dehydration was not prominent in the men who did not sweat, whilst some of the hyperpyrexial cases were probably superhydrated before they lost consciousness.

Provided young and healthy men are removed promptly from a warm environment to a cool place when they reach the limit of their endurance, and their water and salt requirements are met adequately they will recover rapidly. If there is delay irreversible changes, due to a high body temperature or dehydration, may occur in the central nervous system and elsewhere (Malamud, Haymaker and Custer, 1946), and they may sustain more lasting damage or fatal injury.

Control of the thermal factors and work level and the correction of water and salt deficiencies to compensate for heavy sweating when adequate control is not possible are the cardinal measures for preventing incapacitation in warm environments.

CONTROL OF THE THERMAL ENVIRONMENT

Recent research sponsored by the Medical Research Council (London) and the

Admiralty provides evidence that the effects of working at high temperatures in the tropics are similar to the effects observed on men doing the same kind of work in temperate climates provided men are trained to work in the heat (Ellis, 1953a, 1954). The same preventive measures probably apply for acclimatized men whatever the geographical situation. Older men (Ladell et al., 1944) and men who are overweight (Morton, 1944; Schickele, 1947) may succumb first. But, even when differences such as these are eliminated and levels of acclimatization and training are ironed out by repeated daily exposures, there are still marked differences in individual reactions which will cause one man to collapse in a climate others can tolerate with ease.

Attempts to identify limiting environments only by the experimental approach may be misleading if the results are interpreted carelessly. The level of the wet-bulb temperature has been considered by many authorities to provide the most useful guide as to whether men can be expected to work efficiently in a warm atmosphere or not. Others have used the effective temperature scales devised by Houghten, Yaglou and their co-workers, which take the air temperature, humidity, air movement and clothing into consideration (Houghten and Yaglou, 1923; Houghten and Yaglou, 1924; Yaglou and Miller, 1925; Houghten, Teague and Miller, 1926; Houghten and Teague, 1928). There is adequate evidence, from the tropics and temperate latitudes, that lightly-clad young men, who are well acclimatized to high temperatures, can do light or moderately heavy work for a few hours when the wet-bulb temperature or the effective temperature is 90°F, or even higher (Eichna, Ashe, Bean and Shelley, 1945; Robinson, Turrell and Gerkling, 1945; Adolph, 1946; Ellis, Ferres, Lind and Newling, 1954), but we cannot ignore Haldane's (1905) observations on less highly trained men, recorded nearly 50 years ago, that in still and warm air *continuous hard work becomes impracticable when the wet-bulb temperature exceeds 78°F*, and that

beyond 88°F "it becomes impracticable for ordinary persons even to stay for long periods in such air, although practice may increase to some extent the limit which can be tolerated." Whilst Schickele (1947) reports that heat deaths occurred not infrequently in the United States Armed Forces between 1942 and 1944 when the wet-bulb temperature was in the seventies. She commented "most fatalities associated with heavy exercise occur at relatively low temperatures, when the total heat stress is commonly underestimated." The United States Army (1954) and Navy (1954) suggest that a weather-eye be kept for casualties when the wet-bulb temperature exceeds 75°F; but it is well to remember that in the tropics most acclimatized persons who are appropriately clad will find this an ideally comfortable temperature for light or sedentary activities (Ellis, 1953b). The United States Marine Corps (1954) advises caution when the wet-bulb temperature exceeds 82°F with an air temperature of 90°F or 75°F with an air temperature of 100°F (each corresponds to a normal effective temperature of about 84°F, when the average air speed is 50 ft/min).

During World War II the Royal Navy, following the example of the United States Navy, phrased its recommendations in terms of the effective temperature scales, but accepted a "correction" proposed by Bedford (1946) as a temporary expedient to make approximate allowances for radiant heat in ships' compartments where this factor was important, by utilizing the globe-thermometer temperature in place of the dry-bulb temperature when the effective temperature was determined. It was recommended that in British warships in the tropics the effective temperature (or "corrected" effective temperature if radiant heat was a factor) should be kept below 80°F if possible and should not exceed 86°F. This is supported by the results of recent British experimental work, except that 78°F is preferable to 80°F as the upper desirable limit (Ellis, 1952b, 1953a and 1953b), which accords, I believe, with the standards accepted by the United States

Navy. If the ventilation and air-cooling arrangements permit warmer conditions than 86°F effective temperature for more than a few hours, reduced efficiency must be accepted, and relatively small additions to the heat load, work load, clothing or duration of exposure, may turn a tolerable situation into one which a man cannot withstand. A survey of heat incapacitation reported last year from Fort Lee (Heffernon, Hittner, and Kocis, 1953) suggests that this generalization may also apply to acclimatized groups in warm areas of the United States. When the men were unacclimatized the first cases occurred when the daily "high" effective temperature exceeded 72°F, but after this phase a notable increase in casualties was only observed when the effective temperature exceeded 83°F; and these investigators apparently did not allow for solar radiation, which might well have raised the "corrected" effective temperature above 86°F.

WATER AND SALT REQUIREMENTS

The amounts different men sweat under the same conditions vary; and so do their water requirements. There is no such thing as a standard water ration, except for logistic planning. It has been suggested as a guide that men should be trained to drink enough to produce 30 oz. of urine per day (Ladell et al., 1944). In warm atmospheres cool water (70°F) is more palatable than tepid water; it is more effective in controlling body temperature and men will drink more of it. The amount of cool water which can be taken with comfort is related directly to the amount men sweat, inversely to the amount their body temperatures will rise (Ellis, Ferres and Lind, 1954), and directly to the time for which they can survive very warm conditions (Ellis, Lind and Newling, 1953). Heavily chlorinated water is less palatable than water which does not taste of chlorine and many men will not drink all they require if water sterilization is overdone. Limited water supplies may be conserved by reducing sweating, by resting in the shade, avoiding heavy work in the heat of the day, and by wetting clothing with

non-potable water (Adolph and associates, 1947), or by drinking small quantities frequently rather than larger amounts at less frequent intervals (Kenney, 1954).

As the salt content of sweat also varies (0.1-0.6%) the salt requirements of different men differ considerably. A man must learn by experience what he needs. Absent or low chloride in a concentrated urine is a useful early sign of salt deficiency (McCance, 1936). *Too much salt is a bad thing as well as too little* and gives rise to malaise, purging and skin rashes. Unless men are sweating continuously or repeatedly they do not require extra salt, and most sedentary workers on shore in the tropics do not need supplements unless they take strenuous exercise. Extra salt in the cooking and on the plate at meal-times, coupled with sound propaganda, will meet most requirements; and the salt content of bread can be doubled without affecting its palatability (Ellis, 1954). When men are sweating heavily supplements to the dietary intake are usually necessary. In recent experiments at very high temperatures in Singapore a ration of one gramme of salt per litre of sweat secreted was adequate when acclimatized men worked in the heat for only 4 hours each day, but it was insufficient when the same experiment was repeated after a 4-hour rest. Many people find uncoated salt tablets unpalatable. Sugar and enteric-coated tablets are tolerated well in our experience provided too many are not taken at one time. Salt water (0.1%) is also acceptable to most people who need it.

PRACTICAL ISSUES

Although the problem is complex most of the practical remedies are obvious. Many heat casualties occur in unacclimatized men doing hard work. Their work load should be stepped up gradually, and may have to be reduced if the weather suddenly becomes appreciably warmer or more humid when the wet-bulb temperature is over 70°F.

Men who are nearing the limits of their endurance are often in a state simulating that seen with anoxia. They cannot be relied

on to know when they have had enough and may continue to work on automatically if allowed to do so. It is desirable that whoever is in charge should not be exposed to such severe stress as the men, or he may fail to recognize imminent casualties, or to act promptly and correctly when they occur.

It is a platitude that *tired men will succumb before those who are fresh*. But the practical implication of this, that when men are not working in a warm atmosphere everything should be done to ensure that they may rest and sleep at night in a comfortably cool place so that they may return to their labours refreshed, attracts less attention than it deserves. Furthermore, this will practically eliminate prickly heat as a problem.

The most important decisions are those made by the executive and materiel authorities, not by the doctors. They decide whether or not a ship or a building will be air-conditioned, whether fans will be provided to keep the air circulating briskly when air conditioning is impracticable or undesirable, whether adequate cool water supplies are to be available, how far the indoctrination of non-medical personnel is to be carried, what clothing will be worn, whether working routines will be modified or periodic leave in cooler areas arranged.

In war, a commander may have to choose between the evils of dehydration or letting his men drink water which may be contaminated or he may have to make a forced march under seemingly intolerable conditions in order to complete an operation successfully. *If, however, a training camp commander accepts complacently an increase in heat casualties amongst his trainees—direct evidence that the whole group are under severe strain—his viewpoint is hard to defend.* For here is an excellent opportunity to teach the men how to look after themselves in warm climates, and informative instruction is more appropriate than a die-hard disregard for an obvious hazard.

In conclusion, it is suggested that there should rarely be a serious problem nowadays except in extreme operational circumstances.

But if the medical advice is sound and the recommendations are stated clearly, the ultimate responsibility must rest with the command. We should ensure that this responsibility is accepted in practice as well as in principle.

SUMMARY

Heat incapacitation is usually preventible, except in extreme operational circumstances. Yet the incidence was considerable at times in the British and American Armed Forces during World War II. In recent years it has given rise to concern in the United States Army and Marine Corps and in military establishments within the United States rather than in units serving abroad. The incidence of heat illness is usually underestimated by official sickness records and comparisons between different communities are not helped by the varied terminology used for classifying the effects of heat. Incapacitation is usually caused by the effects of an unduly warm thermal environment and hard work associated with salt and/or water deprivation (heat exhaustion). Less commonly diminution or cessation of sweating, and the consequent loss of evaporative cooling, complicate the picture and may lead to hyperpyrexia (heat stroke). Although heat stroke is encountered less commonly than heat exhaustion, more deaths are due to this than to heat exhaustion. General principles in the control of the thermal environment and the prevention of salt and water deprivation are discussed; and the role of the medical officer as an adviser to the military or naval command is stressed.

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CUT OUT AND SAVE

Individual and Racial Variations in a Vascular Response to a Cold Stimulus

By

CAPT. JOHN P. MEEHAN, JR., USAFR (MC)*
(With five charts)

A COMPREHENSIVE review of cold injury during the Korean winter campaign of 1950-51¹ called attention to the fact that there was a higher percentage incidence of cold injury, particularly to the extremities, among Negro troops than among Caucasian troops. Also, during the winters of 1951-1952 and 1952-1953 Negro military personnel assigned to Ladd Air Force Base suffered a higher percentage incidence of second and third degree frost bite of the hands and feet than did Caucasian military personnel. Although factors difficult to control, such as improper use of protective clothing, could have been responsible for the higher injury rate among the Negroes, many instances of frost bite occurred on well organized maneuvers. It is probable that people involved on such maneuvers were all exposed to cold under substantially the same conditions and that those suffering cold injury represented those of the group most susceptible to cold injury.^{**}

In studying the general problem of human acclimatization to extreme cold, many investigations have been based on comparisons drawn between natives of a very cold environment such as the Eskimo and natives

of a relatively warm environment. It has been assumed that the physiologic reactions or behavior of the natives of the cold environment represent the ultimate in individual acclimatization. The possibility that genetic racial differences could play a role in determining the observed physiologic differences has received little attention. Yoshimura and Iida² have examined this question in the case of a number of the yellow races and, as the result of their particular observations, felt that racial specificity did not contribute to their results.

The variety of subjects available to the Arctic Aeromedical Laboratory made it an ideal place for the study of possible racial differences in the physiologic response of an individual to cold. Military personnel provided a source of both Caucasian and Negro subjects. In addition, facilities available to the laboratory permitted carrying studies into the field and observations could be made on both Alaskan Eskimos and Alaskan Indians.

A study of cold induced vasodilation as first described by Lewis³ was chosen as the basis for the experimental procedure. Yoshimura and Iida² have studied this vascular reaction to cold in large numbers of subjects and with it as a basis have developed an experimental procedure of good reproducibility. The same authors made a careful study of the various conditions that affected their results and have thereby made it possible to establish those factors requiring standardization in order to insure a reproducible experiment.

SUBJECTS

Three basic groups of normal subjects were used in the experiments, namely, a Caucasian group, a Negro group, and a

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** During an Army field exercise held in interior Alaska in February, 1954, approximately fifty percent of the cold injuries experienced were in Negro military personnel. Negroes comprised approximately ten per cent of the troops in the field. Thirty-one instances of cold injury were treated at Ladd Air Force Base Hospital during this exercise. Twenty-one of the cases were Negroes. The greater susceptibility of the Negro to cold injury is clearly indicated. (The foregoing information was supplied by Lt. Col. A. I. Karstens, Commanding Officer, and Major H. F. Drury of the Arctic Aeromedical Laboratory.)

group of Alaskan Natives. Both the Caucasian and Negro groups consisted of regularly assigned military personnel of Ladd Air Force Base, Alaska. Subjects of these two groups were chosen so that all used had been in Alaska for approximately the same period of time. None of these subjects had an extensive outdoor experience in a cold climate. Those included in the present study were mostly natives of the southeastern United States, although a small percentage did represent all other parts of the country. The third basic group was made up of Alaskan Natives studied at each of three widely separated native villages. Eskimos were studied both at Gamble, St. Lawrence Island, and at Barter Island, Alaska. Alaskan Indians were available for study at Fort Yukon, Alaska.

The age of all the subjects was between eighteen and twenty-six years. These particular age limits were chosen since the majority of available military people fell within this age range. All subjects were in good physical condition and there was no history of frost bite injury other than mild first degree in any of the people used in the above three groups.

A fourth group of subjects was also studied. This last group consisted of Caucasian and Negro military personnel who had suffered cold injury of at least second degree of either the hands or feet or both.

METHODS

A copper-constantan thermocouple made of thirty gauge wire was cemented to the skin with collodion at the base of the nail of the index finger of the right hand. The position of the thermocouple was further secured by a single layer of adhesive plaster of such size as to just cover the thermal junction. Before actual experimental procedures were started, the subject was required to recline for a period of at least thirty minutes in a warm room (88° to 92° F.). The subjects remained in the reclining position throughout the experiments.

After the half hour rest period and only

after the finger temperatures were 92° F. or above, the fingers were immersed in an ice water bath for a period of thirty minutes. The bath contained melting ice at all times and was constantly and uniformly stirred to insure a steady temperature throughout the bath. The experiment was terminated at the end of the thirty minute immersion period.

Temperatures were recorded on a Brown Electronic Strip Chart potentiometer. Actual thermocouple readings were printed by the potentiometer every fifteen seconds. A Leeds and Northrup manual potentiometer was used with fourteen subjects studied at Gamble, and in this case, finger temperature observations were obtained every thirty seconds.

RESULTS

The number of individuals in each general racial group of subjects studied is given in Table I. Figure 1 shows the average finger cooling curves for each of the groups of normal subjects. It is to be noted that the curves for the Alaskan Native groups are not separable from one another while the Caucasian (white) group curve occupies the mid-position on the chart with the Negro group being described by the bottom curve.

The mean temperature maintained by the finger during the last twenty-five min-

TABLE I
EXPERIMENTAL SUBJECT GROUPS

Subject group	No. of Subjects
I. Normals	
Alaskan Eskimo	
Barter Island	14
Gambell, St. Lawrence Island	14
Alaskan Indian (Fort Yukon)	24
<i>Alaskan Native, total</i>	52
Negro military personnel	38
Caucasian military personnel	168
II. Subjects having experienced cold injury	
Negro	9
Caucasian	12
Total subjects studied	279

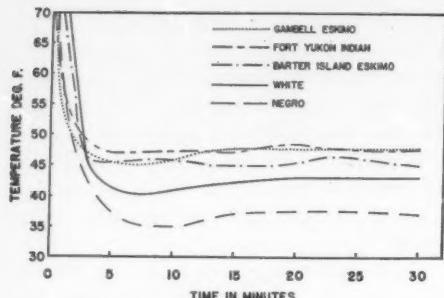


FIG. 1. Average finger cooling curves for various subject groups.

utes of the test period was determined for each subject studied. Figure 2 gives the mean temperature data for the normal subjects classified into three general racial groups: Alaskan Native, Caucasian, and Negro. The abscissas denote the temperatures in the range of importance in the experiment. The ordinates indicate the percent of subjects in each group experiencing a mean temperature at least as low as indicated on the graph. In following the curve for the Negroes, for example, it is seen that forty percent of the subjects in this group had mean temperatures of as low as 32°F. Seventy percent of these subjects had mean temperatures of 36°F. or lower, while 100 percent had mean temperatures below 46°F. It is also seen that none

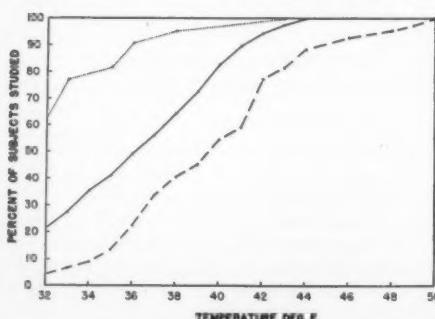


FIG. 2. Mean finger temperatures reached by subjects in each of the three general racial groups studied. Upper curve (dotted line) Negro subjects; middle curve (solid line) Caucasian subjects; bottom curve (dashed line) Alaskan Native subjects. See text for explanation.

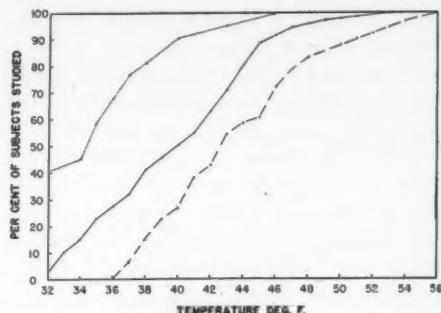


FIG. 3. Lowest finger temperatures reached by subjects in each of the three general racial groups studied. Upper curve (dotted line) Negro subjects; middle curve (solid line) Caucasian subjects; bottom curve (dashed line) Alaskan Native subjects. See text for explanation.

of the native subjects exhibited mean temperatures lower than 36°F. and also that only four percent of the Caucasian group maintained a mean temperature as low as 32°F. The curves additionally indicate the spread of the data and it is to be observed that the Caucasian group has, for practical purposes, a spread that almost entirely encompasses that of the Native and Negro groups.

The lowest temperature reached by the finger of each subject during the half hour immersion period was determined. These data are plotted in Figure 3. Here again the spread of the data in each of the three racial groups is indicated. It is also seen that over 60 percent of the Negro group experienced a lowest temperature of 32°F., while about 20 percent of the Caucasian and five percent of the native groups attained this temperature.

Twenty-one individuals were studied who had suffered cold injury of at least second degree severity to the hands or feet. Nine of these subjects were Negro and twelve were Caucasian. The mean temperature for the last 25 minutes of the test period and the lowest temperatures reached for each subject are given in Table II. It is readily seen from the data presented that the majority of these subjects exhibited little or no

TABLE II

MEAN TEMPERATURES FOR THE LAST 25 MINUTES OF THE TEST PERIOD AND LOWEST TEMPERATURES REACHED BY SUBJECTS WHO HAD EXPERIENCED COLD INJURY

Group	Subject No.	Mean Temperature	Lowest Temperature
Negro	1, 2, 3, 4, 5	32°F.	32°F.
	6	34	33
	7	37	36
	8	40	38
	9	43	36
Caucasian	1, 2, 3, 4, 5, 6	32	32
	7, 8	33	33
	9	34	32
	10	37	34
	11	42	38
	12	42	40

rewarming response after the hand immersed in ice water.

Four subjects were subjected to repeated cooling studies. Two of the four subjects were studied on six separate days and the remaining two were studied on five separate occasions. The general pattern of the cooling curve in the case of each subject remained essentially the same. For a given subject, the mean temperature for the last twenty-five minutes of the test period fell within a range of plus or minus one degree F. while the lowest temperature reached was included in a range of plus or minus 1.5°F.

During the progress of the experiments, one set of identical twins became available for study. The cooling curves obtained on these two subjects are presented in Figure 4. The mean temperature for the last 25 minutes of the immersion period for each of the twins was 45.0° and 44.9°F. respectively while the lowest temperature reached were 43° and 42°F. respectively.

Although the cooling curve was reproducible in a given subject, the nature of the curve varied greatly from subject to subject. Examples of cooling curves of selected subjects are shown in Figure 5. The curve of the Fort Yukon Indian shows the greatest rewarming response of any of the subjects

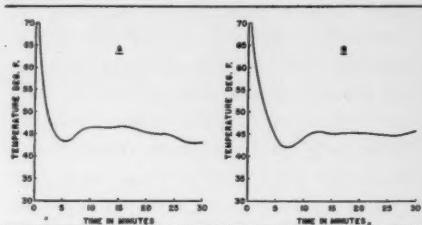


FIG. 4. Cooling curves from one set of identical twins. Mean temperature for the last 25 minutes of the immersion period 45.0°F. respectively. Lowest temperature reached 43°F. and 42°F. respectively.

studied while the curve of the Negro subject is the most characteristic type of response seen in the case of the Negro subjects studied at Ladd Air Force Base.

DISCUSSION

Although the type of experiment here reported is difficult to control, careful attention to the variable that may affect the results does permit good reproducibility of the data in a single subject. The data obtained in the case of the identical twins lends considerable support to the thesis that the experiment does actually give results that represent a physiologic characteristic of the individual.

The data obtained on the twenty-one subjects who had suffered cold injury indicate that as a group these subjects were not able to maintain digital blood flow at a level that would have kept the fingers at a tem-

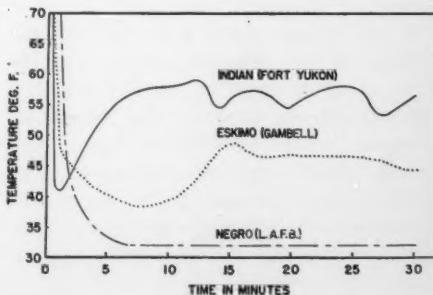


FIG. 5. Sample cooling curves illustrating the wide variation in the type of response to the immersion test.

perature higher than the temperature of the immersion bath. It is not difficult to understand how cold injury might have resulted even in this experiment had the bath temperature been slightly below freezing.

Yoshimura and Iida² have done experiments of this same general design on a large number of Japanese subjects. By applying various statistical considerations to their data, they devised what they termed an index of resistance to frost bite. This index is based on the mean temperature for the last 25 minutes of the test period, the lowest temperature reached, and the time required before the first rise in finger temperature was experienced. In the present study we encountered a number of subjects who failed to show any rise of the finger temperature after the immersion of the fingers was started. For this reason, we have not used the index proposed by Yoshimura and Iida but have chosen to present separately the two types of temperature data previously discussed.

The blood flow in the extremities of the Eskimo has been studied by Brown and Page.⁴ The results reported here in the case of Alaskan Natives are in agreement with those of Brown and Page. The question arises, however, whether or not the differences noted between the Caucasian and Eskimo subjects are due to individual adaptation resulting from prolonged exposure to Arctic climates or to what may be considered racial adaptation that may be inherited on a genetic basis.

In the present study it is true that the division of the subjects studied into the three racial designations used is arbitrary and not entirely accurate. The method is, however, one of convenience and it does permit at least a general separation of racial groups. The differences noted between the Caucasian and Negro groups strongly suggest a racial basis for the results here re-

ported. The differences between the Caucasian and Alaskan Native groups are not as marked and it is not possible to say whether or not these differences represent racial or individual adaptation.

The results of the present study offer a physiologic basis for the reported higher percentage incidence of cold injury seen in Negro military personnel engaged in cold weather operations.

SUMMARY

An experimental procedure involving the recording of surface finger temperatures during a thirty minute ice water immersion period was performed on groups of Caucasian, Negro and Alaskan Native subjects. The average finger temperature for the last 25 minutes of the immersion period and the lowest finger temperature recorded were used as the basis for comparing the responses of the various subject groups. The Alaskan Native group maintained the highest finger temperatures during the immersion period while the Negro group maintained the lowest.

The experimental data indicate the possibility of a physiologic adaptation to cold on a racial as opposed to an individual basis.

A physiologic basis for the reported higher percentage incidence of cold injury seen in Negro military personnel engaged in cold weather operations is presented.

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Fibrosis of the Appendix: A Clinical Entity of Military Importance

By

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(With four illustrations)

IT HAS been the experience of every surgeon, after making a clinical diagnosis of acute appendicitis, to find at operation a grossly normal appendix which on routine section with H & E stain shows no evidence of acute inflammation. Obviously, there are instances where the patient does not have appendicitis, has never had appendicitis, and is not relieved by appendectomy. Equally obviously, there are instances where the patient gives a story compatible with appendicitis, shows no gross changes at appendectomy, the H & E sections are reported as normal, and the patient is completely relieved. In an attempt to elucidate the problem, a study has been made of all cases and specimens between 1950 and 1953 at Brooke Army Hospital, in

which the diagnosis of "interval appendix," "chronic appendix," "subacute appendix," "appendicular fibrosis" or "appendical mural fibroliposis" was returned by the pathologist.

MATERIAL AND METHODS

This study is based on 649 non- incidental appendectomies performed at Brooke Army Hospital between 1950 and 1953. Each case has been studied from the standpoint of history, physical findings, the surgeon's and surgical pathologist's description of the gross specimen, and the microscopic features of the hematoxylin and eosin stained sections. Table I shows the pathological conditions found in the entire series. The surgery was performed by many surgeons, usually from the resident staff.

Of particular interest to us was the group of patients (105 cases or 16.23% of the total series) in whom signs and symptoms

TABLE I
APPENDICAL DISEASE AT BROOKE ARMY HOSPITAL, 1950-53

	Number	Percent
Acute suppurative appendicitis	523	80.58
Immediate appendectomy (504)		
Interval appendectomy (19)		
Carcinoid	2	.31
Mucocele	3	.46
Adenocarcinoma	1	.15
Oxyuriasis	4	.61
Tuberculosis	1	.15
Fibrosis appendix ("chronic")	64	9.86
Mild fibrosis	21	3.25
Normal (no fibrosis; no other disease)	20	3.12
Normal (diagnostic errors)	10	1.5
Ureteral stone (1)		
Salpingitis (5)		
Gastroenteritis (2)		
Ruptured ovarian cyst (2)		
Total Appendectomies (not incidental)	649	

compatible with acute suppurative appendicitis were present, but in whom at the time of surgery the appendix presented no gross evidence of acute inflammation and in which the three H & E stained sections were reported by the pathologist as showing "normal appendix," "chronic appendix," "subacute appendix," or "fibroliposis of the appendix." In an effort to study more thoroughly the histological picture in this group of cases, twelve additional sections were cut from each paraffin block and stained with hematoxylin and eosin, Masson's trichrome, azocarmine, and a tissue stain for bacteria. When feasible, gross specimens were sectioned longitudinally and studied grossly and microscopically in detail.

PATHOGENESIS OF APPENDICAL INFLAMMATION

Pathological nomenclature is based on a static concept of disease and does not take into account the fact that "catarrhal," "suppurative," and "gangrenous" appendicitis all are part of the same dynamic process. Appendicitis passes by stages through a series of changes culminating in gangrene and perforation unless the obstruction is overcome and the secondary infection controlled. The gross and microscopic picture in any given case simply indicates the point to which the disease has advanced before being arrested by the surgeon. Similarly, the specimen may show the degree of healing and the consequent residuals.

The experimental work of Wangensteen and Bowers¹³ and others,^{4, 12, 14} coupled with observations on human cases, have shown that obstruction is the important etiological mechanism in acute appendicitis. In man, pressure-distention is the exciting factor^{4, 14} and bacterial invasion of the injured wall is a secondary phenomenon. Appendicitis essentially is a form of closed loop obstruction. An impacted fecolith is the responsible obstructing factor in about 80% of cases,⁵ but other causes of obstruction may be swelling of abundant lymphoid tissue,⁶ fibrous contraction of the proximal appendix from

previous attacks, kinking of the appendix by a band or fold, foreign body impaction or neuromuscular dysfunction from fibrosis. In the development of acute appendicitis the lumen becomes occluded by one of these mechanisms and peristalsis is stimulated as the appendix attempts to empty itself. This causes the early cramping, intermittent pain. The appendix in man is a secreting organ¹⁴ and obstruction acts as a secretory stimulant causing the distal lumen to distend with fluid. This causes nerve-end pain which is more constant in character. As distention increases, capillaries and venules become obstructed, blood flow is slowed, vascular congestion follows, edema develops and diapedesis of leucocytes occurs. As distention and edema progress, nerve endings are destroyed by pressure or anoxia. Thrombosis eventually results, the distal thinned walls undergo pressure necrosis, the mucosa becomes ulcerated and muscle tissue dies. At this stage, bacteria from the lumen are free to enter the tissues.⁵ Gangrene and perforation eventuate unless the appendix is able to overcome the obstructing mechanism short of this termination by expelling or dissolving the fecolith or by overcoming the obstruction in some other manner.

Experimentally and clinically it is well known that inflammation heals by fibrosis which is directly proportional to the severity of the original inflammatory process. Also, it is known that repeated episodes of inflammation cause added increments of fibrosis to be superimposed. Bowers⁵ previously has shown experimentally that the dog's appendix heals by marked fibrosis with fibroplastic collars around the submucosal vessels, fibrosis of the areolar submucosa, breaking up of the muscle layers by fibrous tissue, thickening of the serosa, and in some instances, replacement of the mucosa by fibrous tissue with consequent luminal obliteration. Cutler,⁶ Boyd,⁷ and others^{1, 10, 11} have stated that repeated attacks of appendicitis convert the submucosa into dense fibrous tissue. Cole⁸ states that dysfunctional or chronically diseased appendices cause

recurring attacks of right lower quadrant pain which does not radiate and is not accompanied by pulse elevation or leucocytosis. By examining appendices with polarized light, Gargano¹⁰ observed that in "chronic appendicitis" the musculature does not exhibit double refractivity which is characteristic of normal muscle. This was interpreted as indicating an incomplete return to normal after acute inflammation. Bowers⁵ showed that normal excised appendices respond to faradic stimulation for an average of three and one-half hours, whereas acutely inflamed appendices have such damaged musculature that an average response of only twenty-six minutes is seen. This is important in realizing that acute appendicitis, even of mild degree, may cause such severe muscle damage that marked fibrosis and dysfunction develop following healing. In four patients on whom appendectomy was to be performed as an elective procedure following recovery from appendicitis, Bowers⁵ delivered the cecum onto the abdominal wall under local anesthesia and stimulated the intact appendix by means of a weak faradic current. In each instance this caused marked contraction of the appendix with severe right lower quadrant pain which the patient thought simulated the attacks for which he had come to the hospital. Bigelow² made similar observations by pinching the appendix. Aschoff¹ states that 80% of patients show microscopic evidence of previous appendicitis by the fifth decade of life.

RESULTS OF THIS STUDY

Masson Trichrome Stain. In contrast to a recent report by Isaacson and Blades,³ multiple sections stained with the Masson trichrome technic failed to reveal a single neuroma. This is in conformity with our opinion that the mechanism is one of fibrosis and muscle dysfunction.

Hematoxylin-Eosin Stain. This stain is satisfactory for demonstration of obliteration of the lumen, fibrous replacement of the submucosa and thickening of the serosa,

but it does not clearly demonstrate the quantity and distribution of fibrosis. It gives perfectly adequate cellular detail.

Azocarmine Stain. This stain clearly differentiates connective tissue from other tissue elements and sharply reveals the perivascular collars and fibrous strands in the muscle layers. Azocarmine is the most reliable staining technic for this purpose and based on careful microscopic study of these sections, the cases were grouped as follows: 1) marked appendical fibrosis, 2) mild appendical fibrosis, and 3) normal appendix (Table II). After this grouping had been made, the gross and microscopic features were studied from this standpoint.

Marked Appendical Fibrosis. The most characteristic gross feature was thickening and rigidity of the wall with loss of the ordinary soft, compressible feel when the appendix was rolled between the fingers. Although a few specimens were unusually long, the majority were short but within normal limits. In all cases where there was a long-standing history of repeated attacks of right lower quadrant pain, adhesions and abnormal bands were found in the region of the cecum and appendix. The mesoappendix frequently was short and thickened, resulting in kinking of the appendix. The lumen usually was dilated just distal to the obstruction but complete obliteration of the distal lumen was a common observation. Other organic residual changes included obliteration, stenosis, fibrous septa dividing the lumen into locules, mucocele formation and false diverticula of the wall.

Marked fibrosis of the submucosa was the

TABLE II

	Number of Cases	History of Pre- vious Attacks	Complete Pain Relief by Appen- dectomy
Marked fibrosis	64	70.3%	86.4%
Mild fibrosis	21	23.8%	72.3%
Normal Appendix	20	15.0%	66.6%

dominant microscopic feature with not infrequent collections of lymphocytes in the submucosa and muscularis. Another constant feature was the abundant adipose tissue in the submucosa. Perivascular collars of fibrous tissue (Fig. 1) around submucosal vessels were noted in the majority of cases. In many instances the muscularis was fibrotic and the muscle fibers were separated into small masses by accumulated fibrous tissue. Usually the muscle layer was atrophic but occasionally seemed thicker than normal (Fig. 2). Varying degrees of obliterative fibrosis of the lumen (Fig. 3, 4) were an almost invariable finding.

Mild Appendical Fibrosis. In this group of cases the only consistent variation from normal was a slight to moderate increase of fibrous and adipose tissue in the submucosal layer.

Normal Appendix. Cases in this category showed no gross or microscopic evidences of fibrosis or other abnormality.

CLINICAL FEATURES OF MARKED FIBROSIS GROUP

Clinical records on the 64 patients in this group were studied and the following data were obtained: The average age of these patients was 25 years; the youngest being 12 and the oldest 52. Nearly 85% of the patients were males as would be expected in a military hospital. Nausea and vomiting were not prominent symptoms, but abdominal pain, especially intermittent, right lower quadrant, cramping pain, was the most consistent subjective complaint. Most patients had abdominal tenderness which was limited to the right lower quadrant. Rebound tenderness seldom was elicited. The total leucocyte count and the differential count were within normal limits in over 90% of the patients in this group.

FOLLOW-UP DATA

Questionnaires were sent to the 105 patients making up the marked fibrosis, mild fibrosis and normal appendix groups in an attempt to determine how many had been relieved of their attacks of pain by appen-



FIG. 1. This photomicrograph shows perivascular collars of fibrous tissue in the submucosa.



FIG. 2. Marked thickening of the circular muscle layer due to fibrous infiltration is shown. Also there is obliterating fibroliposis of the lumen.



FIG. 3. Here the lumen is replaced by fibrous tissue. The muscularis is broken up into small masses by strands of fibrous tissue.

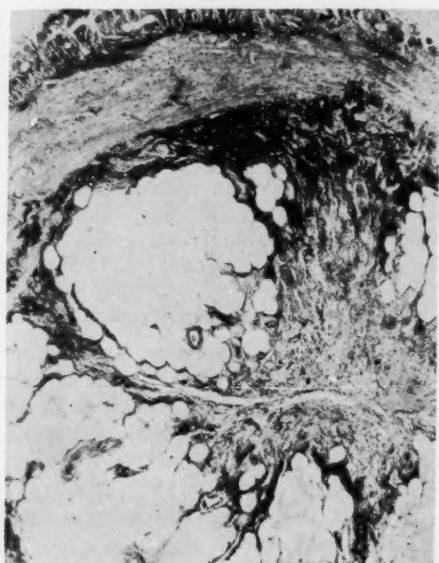


FIG. 4. This photomicrograph shows complete obliteration of the appendical lumen by fat and fibrous tissue. Perivasculär fibrous collars are noted.

ectomy. Bear in mind that all 105 were operated upon because the surgeon felt that they had appendicitis. In the marked fibrosis group, 70.3% of patients gave a history of previous attacks of right lower quadrant abdominal pain. Many of these patients had been hospitalized four to six times for observation because of abdominal pain. Many of these patients had experienced intermittent pain for ten to fifteen years. In the marked fibrosis group, 86.4% of patients had complete relief of symptoms following appendectomy. In the remaining 13.6% of the group, all claimed improvement and the complaints related to minor incisional discomforts.

In the mild fibrosis group it is interesting that 72.3% of the 21 patients received complete relief of abdominal pain by appendectomy even though only 23.8% gave a positive history of previous attacks.

In the normal appendix group of 20 patients, 66.6% were completely relieved although only 15% had a positive past history for abdominal pain.

PROPER PATHOLOGIC EXAMINATION OF THE APPENDIX

Since local Tissue Committees and various inspecting and certifying bodies use the removal of "normal" tissue as one criterion for judging surgical excellence, the surgeon feels that he is on the defensive if the pathologist fails to report "acute" changes in the excised appendix. Such an attitude is not entirely correct nor fair since in the series herein reported, while 80.58% had acute appendicitis, an additional 14.77% showed conditions for which appendectomy was indicated and an additional 2.14% of patients had complete relief of symptoms for which operation was undertaken. Thus in 97.49% of the 649 cases, operation was proper regardless of pathological report. In 1.5% of the series there was a clear diagnostic error and in 1.01% normal appendices were removed without benefit to the patient. This record is well within the limits of acceptability.

It seems to us that there are two possibilities for improvement in present pathologic examination of appendices. The first relates to preparation of the material and the second to staining and reading the sections. It has been clearly shown⁵ that longitudinal section of the entire previously fixed appendix is necessary to an adequate examination. The common practice of taking a small transverse block from distal, mid- and proximal portions of the appendix will fail to show the obstructive mechanism in the majority of cases and this one factor leads many pathologists to state that they never find obstruction. This procedure also favors missing loculation of the lumen, luminal obliteration, false diverticula, foreign bodies in the lumen, and other interesting findings which may have an important significance. It should be clearly realized that appendical fibrosis is a clinical entity, relieved by appendectomy, and that H & E staining is a poor way to demonstrate these changes. The pathologist who does not recognize the importance of appendical fibrosis is likely to report "no evidence of acute inflammation" on three transverse sections and let it go at that. This may be unfair to the conscientious surgeon who has benefited his patient.

COMMENT AND DISCUSSION

From our own experience and that of others herein reported, we feel that acute appendicitis can be diagnosed at least 80% of the time and that in about 97% of cases we can determine correctly, preoperatively, which patients require appendectomy. If the pathologist bases his opinion solely on presence of acute inflammation, his percentage of "needless" appendectomies will be higher than is warranted by clinical follow-up data. It seems obvious that a dynamic approach through an appreciation of pathologic physiology is more accurate than the static approach limited to acute changes.

In addition to the patient who comes to the hospital because of an acute episode, we see a moderate number of patients in military hospitals who are hospitalized re-

peatedly for minor attacks of right lower quadrant pain, often over a period of years. Our philosophy is that many such patients have mild to severe appendical fibrosis and we feel that if other pathologic processes can be ruled out, such patients deserve appendectomy. Part of the reason for this lies in the knowledge that such patients, subject to recurrent mild attacks, may go on maneuver, be sent overseas, be on a long voyage or flight, or for some other reason be inaccessible for surgery should a more severe attack eventuate. The exceedingly small risk from appendectomy seems less than the risk of serious consequences of procrastination. When such patients are admitted to our service, we conduct a complete evaluation including gastrointestinal, gallbladder and genitourinary investigations. If all of these are noncontributory and the patient has had repeated attacks of right lower quadrant pain, appendectomy is advised. We never have had occasion to regret this policy.

Occasionally, barium enema in such cases gives a positive indication for appendectomy. Such positive findings include visualization of fecoliths either as positive shadows or as filling defects, an appendix out of position such as retroceccally placed, an appendix which fails to empty when the enema is evacuated, an appendix which is abnormally long and an appendix which is kinked or coiled. We accept such findings as clear evidence of appendical dysfunction which will benefit by appendectomy.

SUMMARY AND CONCLUSIONS

1. A series of 649 non- incidental appendectomies at Brooke Army Hospital between 1950 and 1953 has been studied in an attempt to elicit information on those not reported as "acute appendicitis" by the pathologist.
2. In 80.58% of cases acute appendicitis was reported.
3. In 16.23% of the total series, such diagnosis as "normal appendix," "chronic appendix," "subacute," "appendicular fibro-

sis" and "fibroliposis of the appendix" were reported.

4. In these 105 specimens, no neuromata could be found on appropriate staining.

5. However, 9.86% showed marked fibrosis and 3.25% showed mild fibrosis on azocarmine stain.

6. In the marked fibrosis group (64 cases), 70.3% had a positive history of previous attacks of right lower quadrant pain and 86.4% had complete relief by appendectomy.

7. In the mild fibrosis group (21 cases), 23.8% had a positive past history and 72.3% were completely relieved by appendectomy.

8. In those cases (20) where no pathologic changes could be shown, 66.6% had no further pain although only 15% could give a past history of previous attacks.

9. It is emphasized that fibrosis of the appendix is a clinical entity which can be recognized although the pathologist may report "normal appendix" on cursory examination.

10. Evidence is adduced to show that the appendix becomes fibrosed as a residual of repeated minor inflammatory episodes and that appendectomy is a proper treatment for this condition.

11. A dynamic approach through understanding of pathologic physiology is urged.

ACKNOWLEDGEMENT

The authors are indebted to Colonel Carl J. Lind, Jr., MC, Chief of Laboratory Service, and to Captain Robert I. Bosman, MC, of the Laboratory Service, Brooke Army Hospital, for technical help in obtaining the

slides and for assistance in reading the sections.

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Conservative Treatment of Arterial Traumatism Due to Firearms

By

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THE present series of operations, performed between May 1953 and July 1954 on the Hanoi front, confirms mainly the opinion of American surgeons of the Korean war which one of us had the opportunity to learn at the International Congress of Vascular Surgery held at Lisbon in September 1953.

As a matter of fact, the cases presented by Jahnke and Howard (56 cases), by Spencer and Grew (93 cases) as well as our unpublished 43 cases allow us to revise the classical conceptions of surgical therapy of arterial war injuries. Technical progress, particularly the use of clamps, of very fine atraumatic needles, and, lastly, of appropriate everted stitches, together with an extremely effective antibiotic and anticoagulant therapy, allowed to expand considerably the field of conservative treatment in vascular surgery. Lateral suture, end-to-end suture, and graft must henceforth constitute the treatment of choice for arterial war injuries.

The clinical and anatomical analysis of nearly 250 personal observations of injuries to big arteries suggests the following few remarks:

1. The absence of *classical clinical syndromes* frequently makes us hesitate to diagnose vascular injury. As a rule, one is obliged to suspect an arterial lesion every time when the course of a wounding agent crosses the direction of the big vessels.

2. There is need for *auscultation of the center of trauma*. This is a classical means of exploring arterial injuries, a simple and particularly sensible method that often reveals: (a) either râles synchronous with systole and caused by gross pulsatile hematoma, or (b) continuous murmur, strengthen-

ing during systole, due to an arterio-venous fistulization which generally forms immediately after injury, as we were able to show in previous articles.

3. In emergency conditions of fresh wounds arteriography, this logical and accurate investigative method, would be indeed of little help, if any.

Systematic interventions show that the *anatomic lesion* does not always coincide with the preliminary clinical diagnosis. Among our 43 cases we found: 5 endarteritic contusions with thrombosis; 4 arterial complete fistulas; 4 lateral wounds; 3 complete cross-cuts; 11 arteriovenous aneurysms of which two were with paravascular pouch with drainage from one of the vessels; 14 pulsatile hematomas, and 3 secondary hemorrhages due to separation of slough.

The *general principles* of restorative therapy of arterial war injuries are identical with those of classical war surgery:—(1) earliness of intervention; (2) necessity to operate in a well-equipped surgical unit rather than in the ordinary front-line aid station; (3) wide approach to the injured vessel, with maximal sparing of the muscular supporting envelope of the blood channels.

Four additional points deserve *special consideration*:

(1) *Necessity to make the field of operation white and dry*. Temporary hemostasis is one of the basic conditions in this type of surgery. To the tourniquet, we prefer exposure and clamping of the vessels at two points, upstream and down stream, way above and below the actual site of the injury. To do so, one should not hesitate in certain special cases to *resort to major measures* such as (a) laparotomy above and below the um-

TABLE I
RESULTS OF CONSERVATIVE OPERATIONS

Type of operation	No. of cases	Result					Deaths
		Exc.	Good	Average	Fail.	Amp.	
Lateral suture	9	8	1				
End-to-end suture	23	13	6	2	1	1	
GRAFTS							
a) venous grafts	6	3	2	1			
b) homeografts							
1. Preserved	1		1				
2. 10 hours in serum	1					1	
3. fresh	3	1		1	1		
TOTALS	43	25	10	4	2	2	0

bilicus for exposure of the aorta, (b) left anterior thoracotomy in the second intercostal space for the left subclavian (1 case), (c) total median sternotomy for the innominate artery and left intrathoracic CP artery (2 cases).

(2) Necessity to *discard clips*, particularly hooked clips, in the confusion caused by profuse hemorrhage, since they aggravate the bleeding and definitely imperil the vascular wall.

(3) Necessity of *thorough excision of the injured parts* since these are the site of histological lesions.

(4) Preference that we give to the Blalock type of *mattress suture*, the best to join the endothelial layers face to face.

The *type of operation* depends essentially on the extent of the lesions encountered. Thus, we have performed 9 lateral sutures, 23 end-to-end sutures, and 11 grafts of which 6 were venous autografts. The special circumstances of war allowed us to experiment with *fresh arterial homeografts* which were removed from persons dying on the operating table (4 cases). All in all, the outcome is far better with sutures than with grafts. End-to-end sutures, after excision, are by all means the treatment of choice. Our results are summed up in Table I.

There are thus 35 good results (80%)

out of 43 operations, and 4 failures:—2 leaks on the 6th and 10th day, 1 aneurysmal transformation of a fresh arterial graft, and 1 extensive thrombosis.

Of the 4 failures, two led to amputation. The first amputation was caused by an extensive thrombosis resulting from incorrect and prolonged handling of a thrombus of an arteriovenous aneurysm of the femoral tripod (in Scarpa's triangle). The second followed a moist gangrene which was produced by ligature of the arterial ends in infected surroundings; the ligature was needed owing to leakage of an end-to-end suture on the 6th day (FS at the Hunter canal).

The incidence of amputation is thus 4.6% (against 10.3% for Jahnke and Howard, and 25% for Spencer and Grew). Hence, our immediate results are definitely far more superior to ligatures (49% resulting in amputations according to the summary statistics of De Bakey and Simeone for the Second World War).

The results classified according to the injured vessels are set forth in Table II.

Thus, the results of conservative surgery are more conspicuous in reference to arteries such as the lower axillary, upper humeral, lower popliteal, common femoral, etc., which are usually considered dangerous. The ultimate outcome is also much better than that

TABLE II
OPERATIVE RESULTS BY VESSELS

Vessels		No. of cases	Good results	Failures	Amputations
Name	Level				
Subclavian	interscalenic	1	1		
CP	{lower upper	2 3	2 3		
Axillary	{extra-pectoral retropectoral subpectoral	1 4 2	1 4 1	1	
Humeral	{upper lower	1 6	1 6		
Femoral	{common FS: upper medium Hunter	6 6 2 4	5 6 2 3		1 (crossing) 1 (anulus 3d AD)
Popliteal	{upper medium lower	4 4 3	4 3 3	1	

of the ligatures whose disadvantages are best summed up in the term of "Leriche's ligature complaint."

CONCLUSION

The superiority of prognosis as to survival

and function is sufficient to accept conservative surgery as the treatment of choice for arterial war injuries, the ligature—which sacrifices vascular continuity—being retained only for cases where restorative treatment either fails or is contraindicated.



TO THE EDITOR:

I should like to call attention to the editorial which appeared in the Journal of the American Medical Association, November 6, 1954, under the title "Deaths Following Sternal Puncture."

Fatalities have occurred during or following sternal puncture for diagnostic purposes as well as while performing sternal infusions. The potential hazards that have been reported arising from the use of both the diagnostic and intra-osseous infusion procedures have unfortunately had much to do with discouraging the greater use of these valuable procedures.

With the proper instruments, hazards are reduced to a minimum in both biopsy and intra-osseous infusion methods. Insofar as intra-osseous infusion is concerned, we now have a simple and safe procedure by which means many lives may be saved when it is impossible to administer whole blood, plasma, or other fluids by the conventional intravenous route. In the event of atomic bomb attack upon this country, a knowledge of the technique of intra-osseous infusion will be the means of saving many a life.

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Workload Measurement for Radiological Services

By

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THREE is a distinct need for uniform reporting and tabulating the amount of work performed by the X-ray Services in the U. S. Army Hospitals. In recent months the subject has been brought to the attention of radiologists and a genuine effort is presently being made to establish a simple, uniform method for recording diagnostic and therapeutic radiologic work. Today a trend exists, in civilian hospitals, to adopt an equitable system of accountancy for per diem payment by health service plans, and

for calculating cost of services rendered to indigent patients.

In the U. S. Army, the X-ray Services are not individually responsible for allocating costs; however, it is the policy of the Army that each individual be cost conscious and that every possible means of conservation be utilized. A formula to measure work performed would result in a control or yardstick for efficient operation—in the allotment of personnel, space, equipment, etc.

A plan to record, systematically and practically, the amount of work done for a

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TABLE I
CURRENT STATISTICAL DATA REPORT USED
IN ARMY HOSPITALS

<i>A. Diagnostic</i>	
a) 1. Total number in-patient examinations	-X
2. Total number out-patient examinations	-X
3. Total number outside consultations	-X
4. Sum total patients examined	-XXX
b) Number of films used	
8×10	-X
10×12	-X
14×17	-X
c) Classification of Examinations	
Chest	-X
Abdomen	-X
KUB	-X
Ribs	-X
Pelvis	-X
Hips	-X
Shoulders	-X
Mandible	-X
Cerebral Angiogram	-X
IVP	-X
Myelogram	-X
Etc.	-X
<i>B. Therapy</i>	
Total number of patients	-X
Total number of treatments	-X

TABLE II
UNIT EVALUATION AT CARLISLE HOSPITAL

<i>1 Unit</i>	<i>4 Units</i>
hand	chest (PA & lat)
foot	pelvis
wrist	gall bladder
elbow	pyelogram
ankle	sinuses
chest (1 film)	mastoid
<i>2 Units</i>	<i>teeth</i>
knee	spine (any one part)
shoulder	<i>5 Units</i>
hip	skull
leg (14×17)	barium enema
eye	<i>6 Units</i>
abdomen	lumbar spine & pelvis
KUB	pelvimetry
nose	bronchogram
<i>3 Units</i>	
face	
jaw	
ribs	
<i>8 Units</i>	<i>12 Units</i>
spine (complete)	complete GI
sialogram	<i>15 Units</i>
uterosalpinogram	complete GI & gall bladder
cholangiogram	
swallowing function	<i>½ Unit</i>
<i>10 Units</i>	therapy (per treatment)
upper GI	
urogram	
motor meal (small intestine)	
myelogram	

specific period of time, based on relative unit values is presented in this paper.

The present method of recording the workload of an X-ray Department consists of listing the total number and type of examinations performed. Table I demonstrates the current statistical data report used in U. S. Army Hospitals.

This method of reporting, generally utilized by the U. S. Army Radiological Services, satisfactorily reflects the number of patients examined and treated and shows the total number of films used. It does not take into consideration the personnel required to do the work, or the amount of time used in doing the work. Utilization of personnel in terms of man hours, in addition to the supplies used, length of time that the equipment is in actual use, and time spent by the Radiologist in interpretation of the roentgenograms should be calculated in determining the total work performed. In Table I each

TABLE III
UNIT EVALUATION USED BY CONNECTICUT
STATE MEDICAL SOCIETY

<i>80 Units</i>	<i>100 Units</i>
hand	foot and ankle
forearm	shoulder
humerus	hip
nose	knee
mandible (1 side)	teeth
foot	
ankle	
<i>150 Units</i>	<i>250 Units</i>
both shoulders	cerebral angiogram
both hips	orbit with localization
both knees	
lungs	300 Units
ribs	entire spine
skull	345 Units
mastoid	gastro-intestinal
orbit	400 Units
spine (1 section)	gastro-intestinal & colon
oesophagus	gastro-intestinal & g.b.
cystogram	500 Units
pelvimetry	G.I., G.B., & colon
colon	
pelvis	
<i>200 Units</i>	<i>X-ray (deep) per treatment—50 Units</i>
special myelograph	<i>X-ray (superficial) per treatment—25 Units</i>
pyelogram	<i>Isotope therapy—100 Units</i>

TABLE IV
SUGGESTED WORKLOAD MEASUREMENT FOR
RADIOLOGICAL SERVICES—U.S. ARMY

<i>1 Unit</i>	<i>2 Units</i>
hand	shoulder
wrist	knee
forearm	hip
arm	nose
thigh	orbit
leg	ribs
foot	PA & 1st chest
chest (1 film)	AP & lat cervical spine
pelvis	AP & lat thoracic spine
diaphragm	AP & lat lumbosacral spine
	any 2 oblique views
	scanography
	stereoscopic views (1 part)
	placentograph plain
<i>3 Units</i>	<i>4 Units</i>
mandible	TMJ
cervical spine with open mouth view	sinuses
	mastoids
	petrous ridges
	teeth
<i>5 Units</i>	<i>6 Units</i>
skull series	chest fluoroscopy
venography	fluoroscopic study
arteriograph	gall bladder series
sinus tract injection	barium swallow
uterosalpinogram	sialogram
<i>7 Units</i>	<i>8 Units</i>
barium enema	GI series
bronchiography	pelvimetry
cystography	myelography
IV pyelography	
retrograde urography	<i>9 Units</i>
esophogram	GI series with motor meal study
	cholangiography
<i>10 Units</i>	
laminography	
kymography	
barium enema with double contrast study	
Sweet localization	
cerebral angiogram	
aortography	
pneumoccephalography	
ventriculography	
retroperitoneal pneumography	
X-ray therapy (1 treatment)	
radium or radon therapy (1 treatment)	
isotope therapy	
	<i>Bedside films add 1 unit per film.</i>

examination without regard to the part of the body examined, or type of examination, is recorded as a unit. It is obvious in doing a cerebral angiogram that the total amount of

work performed is greater than the amount of work required to take a routine chest film. In doing a cerebral angiogram, two (2) X-ray technicians are utilized, eight (8) films are used, and a doctor will work in the roentgenographic room for about one hour.

Use of a differential unit system for the various roentgenographic and therapeutic procedures will obviate the discrepancies which result in recording the work done by using the simple arithmetic method of tabulation.

Unit values for the various X-ray examinations and treatments have been put into use in a number of civilian hospitals. A list of unit values has been used at the Carlisle Hospital, and a second list of radiological service units has been approved by the Radiological Section of the Connecticut State Medical Society. Table II lists the unit evaluation of an X-ray Service, used at the Carlisle Hospital.¹

Table III is the chart which is approved by the Radiological Section of the Connecticut State Medical Society based on relative units.¹

Either of the unit plans in Tables II & III can be used satisfactorily in civilian hospitals since they have been developed with a view to establishing departmental costs. The unit scales in these plans have been established arbitrarily and reflect a difference in the

relative values for the various examinations.

The plan recommended in this paper is a modification of the Carlisle Hospital and Connecticut State Medical Society unit plans. It is felt that this plan would satisfactorily serve to establish a uniform method of determining the workload of the U. S. Army Radiological Services.

The unit used in tabulating the work performed (Table IV) represents an arbitrary figure (Unit-1), and reflects the total work and material used to accomplish a specific examination. Examinations having higher unit values reflect the increased amount of work and materials used; e.g.: G.I. series examination has the equivalent value of eight (8) units. This means that the amount of work and material required to complete this examination is eight (8) times as great as is necessary to complete any examination having a value of 1 unit.

SUMMARY

A suggested plan using the unit system for measurement of workload for the Radiological Service of the Army has been presented.

REFERENCE

¹ Harris, J. H. Reporting X-ray service utilization—a method. Monthly News Letter, The American College of Radiology, Vol. 10, No. 7, July, 1954.



Management of the Climacteric*

By

CAPTAIN PAUL PETERSON, M.D., *Medical Corps, U. S. Navy*

ONE may wonder why an article of this nature is being published in a journal dealing with military medicine. However, a look at the composition of the Armed Services of today reveals that females are now an integral part of all the military services; and, that the military physician is being confronted with the problem of the climacteric more and more in his daily routine. Therefore, it is felt that a discussion of this condition may prove timely and valuable to a large number of the military physicians.

The climacteric, commonly referred to as the menopause, has become a major problem to both the gynecologist and the internist. Often times one finds the patient being referred back and forth between the two with each being reluctant to assume responsibility for the case. It is the purpose of this paper to set forth a means of managing these patients which has been highly successful in the most refractory type cases. The many articles on so-called treatment will not be discussed.

It should be borne in mind that the climacteric is not a disease. The usual definition that the menopause is a gradual transition from the age of reproduction to that of senility should be revised. But few people know how to grow old gracefully now days, and any term referring to senility creates panic in these women. Since women are living to a much older age it hardly seems fair to label them senile at 45 years of age. It is a known fact that women perform the sex act perfectly well or even better after the

menopause in a great number of cases. It is the author's opinion that those who did so before will continue to do so afterwards. Therefore, why not revise the definition so as to be that period of gradual transition from the age of reproduction to that of maturity. Senility actually comes at a later date. The menopause is a perfectly normal, physiological condition through whose portals every woman must pass if she lives long enough. Through miseducation of the public at the time of the advent of hormone therapy every woman has gotten the idea that she should experience no discomfort at all. Therefore, many women rebel at the idea that she has to be the least bit inconvenienced or ill feeling at all. This rebellion is often to the extreme of practically being "temper tantrums" which one sees in a child who cannot have his way. This aggravates all her symptoms.

A second factor which has made the climacteric a greater problem is the environment surrounding the women of today. The environment itself becomes almost a pathological condition since it imposes numerous stresses and strains on women during the menopause that nature had not foreseen when it was expected that woman's activities would be greatly curtailed and her worries largely would be over.

The modern woman is all too frequently subjected to the duress of the whirl of a big social group, of financial headaches, of getting children through college, of a daughter getting married, etc. The social drinking of alcoholic beverages, hot tea or coffee especially before bedtime, strenuous bridge games, etc. are responsible for many a woman spending her night throwing off the covers, opening and closing windows, and getting furious at her husband as he sleeps soundly through it all.

It is not the author's intent to condemn

* From the Obstetrical and Gynecological Service of the U. S. Naval Hospital, San Diego, California. The opinions and/or assertions contained herein are the private ones of the writer, and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

alcohol, tea, coffee or bridge, but to point out that certain adverse effects will follow in the climacteric woman and that if she indulges she is the one who will pay the price, so to speak.

For the purpose of a more clarified discussion and ease of outlining treatment the climacteric will be divided here into the artificial and the natural. Any menopause produced before the age of 45 has been considered to be artificial and so treated; whereas, those whose climacteric comes about naturally or has been produced by artificial means after 45 years of age are all managed alike. The people having an artificial menopause are treated while those with the natural menopause are managed.

THE ARTIFICIAL MENOPAUSE

These women have been deprived of very important secretions which are necessary to their well being at a time when the natural bodily functions require their presence. It is not known, actually, just how far reaching the effects of the ovarian hormones may be, but certainly there are pituitary changes, bone changes, vascular changes, etc. all of which affects the woman's well being. It has been the author's experience that a large number of women who are deprived prematurely of the ovarian hormones for a long period of time will undergo varying degrees of psychosis, and many have to be treated in an institution. Therefore, it is the author's strong conviction that these women should be given substitution therapy and kept on it until they reach the age of 45. There is much discussion as to whether such a routine should be used in carcinoma patients. It has not been the author's practice to use this treatment in carcinoma cases but with less and less conviction as time goes on that he is right.

The following routine is the one usually used with variations in the dosage as is best suited to the individual. Thyroid in one-half grain doses, given at bedtime preferably. The thyroid seems to enhance the effects of the substitution therapy and the two together

work better than either alone. When taken at bedtime the thyroid does not keep the patient awake. If she requires more than half a grain daily, it may be given in the morning, and bedtime or morning, or noon and bedtime in equal doses. None is given at meal time in the evening as such medication does interfere with sleep.

Estrogen is used routinely and if the natural conjugated estrogen is used the dosage is 1.25 mgm three times a day for 21 days and one 1.25 mgm tablet daily for 7 days of each 28 day period. This is easy for the patient to remember since she remembers 3 daily for 3 weeks and 1 daily for 1 week. If synthetic estrogen is used, as for example, stilbestrol, she is given 0.5 mgm three times a day for three weeks and once daily for one week. The patient should be warned that stilbestrol especially may increase the pigmentation of the areola about the nipples, and sometimes reproduces the facial "mask of pregnancy." If the facial pigmentation occurs it is advisable to change to the natural estrogens which are much less prone to produce these changes.

Occasionally it is necessary to add progesterone to the routine. This, however, is seldom necessary when thyroid is used. When it is used the dosage is recommended as 10 mgm three times a day for the last week when 3 doses of estrogens daily are taken and for the week when only one tablet daily dose is taken, that is, progesterone is given over that two week period. It is usually possible to stop the progesterone after several months, six to nine usually. These patients will be found to be much more alert, less complaining, more energetic, etc. than those who have become "adjusted" after an artificial menopause and who are no longer taking any substitution therapy.

THE NATURAL CLIMACTERIC

This is the group of patients who have read the latest magazines and have gleaned the knowledge that women no longer have to experience any discomfort during the menopause. Therefore, they march them-

selves into the doctor's office and demand estrogens. It is the author's practice to ask the patient why she wants estrogens. The reasons given are usually that they have read about them, etc. This gives the physician the opportunity to explain the physiology of the menopause to the patient. Basically, it is the period of readjustment of the body to the absence of the ovarian hormones. It is a rather difficult thing for the body to adjust to the absence of those hormones if they are going to be continued by pills or by needle. Furthermore, it is author's firm conviction that these women become genuinely addicted to the estrogens. Except in very unusual circumstances the estrogens are not used and if the patient has been getting them they are stopped abruptly and the patient is put on the following routine.

Since getting the patient to accept her condition graciously is one of the main problems, it is necessary to review the physiology and the symptomatology of the menopause frequently with the patient in the beginning. Her visits should be as often as indicated but at least once a month in the early stages. Tell her frankly that the treatment will not alleviate all symptoms but rather it will make them bearable. Some form of synthetic vitamin E is used in doses from 25 mgm to 150 mgm three times a day. This has been found to be very beneficial in alleviating the headaches and improving the sense of well-being, but it has not seemed to influence the hot flushes. It has been found that dexedrine 5 mgm at breakfast and lunch will help the hot flushes during the day as well as give the "energy" which they complain of having lost. It also helps to overcome the depression which plagues many of them. If there is evidence of hypothyroidism, thyroid is given as indicated and it will further improve the feeling of depression. If the patient is inclined to be obese the dexedrine is given an hour before breakfast and lunch, but if she is average size or thin it is given with the meal at which time it does not affect the weight or appetite at all. One of the big

worries these patients have concerns their inability to make decisions as promptly as formerly, as well as the forgetfulness which is marked with many of them. The dexedrine and thyroid plus reassurance at each visit will relieve them of the worry that they are "going crazy." During the night these patients have hot flashes, night sweats and inability to sleep. It has been found that benadryl 50 mgm at bedtime is very beneficial for these people and seldom is it necessary to add even phenobarbital as a sedative. The benadryl should be taken each night and not just when she thinks she needs it. Thus, the following are the basic medications:

Synthetic Vitamin E—25-150 mgm tid
Dexedrine—5 mgm A.M. & noon
Thyroid—As indicated
Benadryl—50 mgm H.S. daily
Phenobarbital—P.R.N.—seldom

There are other bizarre symptoms which are seldom relieved by the above, or even by estrogen for more than brief periods of time. Most of these symptoms are inconsistent and one patient seldom has more than one or two of them. They may suffer from any of such symptoms as paresthesia, tinnitus, vertigo, anxiety, agitation, arthritic pains, mild hypertension created secondarily, etc.

So-called senile vaginitis should be referred to as post-menopause vaginitis when talking about it to the patient. In treating it the physiological change which has taken place should be explained to the patient. Estrogen creams locally work very well in these cases, but especially should they be advised to use a lubricant with each sex act. This will alleviate unnecessary trauma.

The reader has been spared the tables of detailed statistics, but suffice it to say that the treatment for artificial menopause has been satisfactorily treated in approximately 98 percent of the cases while the natural menopause has been managed in approximately 90 percent of the cases. This does not mean that all symptoms have disappeared as if by magic, but that the patients have

felt well enough to be imminently satisfied with the treatment. Very seldom one will not be benefited at all.

The author is aware that some or all of these agents have been used by others and with varying degrees of success or complete failure having been reported. However, used in the manner set forth here it has proved to be in the most satisfactory of all the routines used by the writer in handling some 485 natural menopause and 210 artificially produced menopause over an eight and one-half year period from January 1946 through 30 June 1954.

SUMMARY

1. Some general remarks concerning the menopause are discussed along with a proposal to change the definition somewhat so as to remove the stigma of senility.

2. Some reasons for the difficulty in handling these cases are set forth.

3. The delineation between artificial and the natural menopause is made clear.

4. Treatment of the artificial menopause as recommended is with the use of thyroid plus substitution therapy with estrogens and occasionally progesterone.

5. Management of the natural menopause as recommended is by use of frequent visits for explanation of what is occurring, the use of certain drugs for symptomatic treatment. Those used were ephynal acetate, dexedrine and benadryl, plus thyroid and phenobarbital as indicated.

6. The results are discussed briefly without the use of detailed statistics.

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RESERVE OFFICERS

Point credits for retention and retirement may be earned by Reserve Medical Corps officers on inactive duty who attend the Military Medical Section of the annual American Medical Association meeting to be held June 7-9, in Atlantic City, New Jersey. For program of this section see pages 385 and 386 of this issue.

Epidemiology Afoot

By

MAJOR EDWARD J. TOMSOVIC, M.C.*

ANY medical officer may suddenly find himself in the midst of an epidemic of gastroenteritis charged with the responsibility of identifying the origin of the outbreak as well as treating the victims. When this occurs in the field the possibility of pin-pointing the trouble may seem remote; however, a little detective work often is very rewarding as is shown below.

STORY OF THE OUTBREAK AND INVESTIGATION

"_____ Battalion, 350 Infantry Regiment was conducting a unique training exercise in August 1952. The entire unit, carrying its weapons and ammunition, proposed to march 100 miles in five days over rough mountain roads in the alpine region of Austria. On the third day of this ambitious project disaster struck. A number of men suddenly became violently ill with vomiting and diarrhea.

While company aid men plied the victims with hurriedly procured paregoric and bismuth, the regimental surgeon was ordered immediately into the field to investigate. Progress of the march was halted for eight hours, then resumed.

When the surgeon contacted the battalion next morning he found an orderly file moving up either side of a mountain road at five yard intervals. The battalion commander, anxious to make up for lost time, refused to halt the march for questioning of troops. (He and many of the men had bet a little money on the outcome of the "100-miler.") Thus it was that this particular epidemiologic investigation was carried out while in progress afoot.

Starting at the head of one file, the first soldier was quizzed. Had he been ill? When

did he get sick? Vomiting? Loose stools? What did he eat?, etc. His answers were jotted in a pocket notebook as the interviewer hiked along beside him. Then to drop back five yards and question the second man and so on to the tail of the column. While the surgeon worked his way back through one file his assistant was doing the same on the opposite side of the road. It was dusty, sweaty going and several miles elapsed before the two medical officers found themselves alone on the road watching the column grow smaller in the distance.

Jotted notes were hastily compared in the shade of a friendly tree and this picture emerged. First evidence of illness among the troops appeared approximately 1300 hours 5 August 1952 (2 hours after lunch). Symptoms began with severe abdominal cramps and nausea. Vomiting usually followed. Loose stools began shortly afterwards and explosive diarrhea lasting well into the second day was a common complaint. Most of those affected were prostrated and had to fall out of the march. When the men began dropping like flies the entire column had been halted and bivouacked.

A typical case was the following: the soldier became ill two hours after eating lunch; he felt nauseated and had upper abdominal cramps for one half of an hour, then vomited once with some relief; thereafter he continued to have less violent cramps followed by uncontrollable diarrhea; he was unable to continue the march and dropped out; he was unable to eat supper; he began to feel better six hours after the onset of symptoms, was able to eat breakfast and resume the march on the following morning.

Sixty-nine men had been affected, all in "_____" Company. Thirty-four had been evacuated to a dispensary twenty miles distant by jeep ambulance shuttle. Two

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were further evacuated to the field hospital. (All recovered quickly and were returned to duty without delay.)

Interrogation of "—" Company personnel promptly pointed to one item in the noon meal as the source of trouble. Everyone who became sick had eaten sandwiches containing ground ham and cheese. Other suspected foods, including milk that had soured, were eliminated.

The surgeon then drove through the marching column to the night's bivouac area ahead. Here he sought out the "—" Company field kitchen. Inspection revealed a satisfactory state of police. Particular scrutiny of pans used for preparation of the ham and cheese did not reveal any uncleanliness or cracks or crevices where dirt might accumulate.

Inspection of the mess personnel was more revealing. While none of the men had respiratory infections or open sores on the hands, several had long dirty fingernails and two had open acne lesions on the face.

The mess sergeant related how the sandwiches in question had been prepared. The evening of 4 August 1952 he had returned to the company's permanent billets. There he had ground the ham and cheese in the "—" Company kitchen. He had taken these foods, apparently fresh and wholesome, from the refrigerator. They had been ground separately and were brought by truck to the company field kitchen in ration pans. Here the ham and cheese were mixed and made into sandwiches, no other ingredients being added.

The sandwiches were made between 2400 hours, 4 August 1952 and 0400 hours 5 August 1952. They were packed into bag lunches as made and these were distributed at breakfast. Each man carried his lunch in his knapsack until he ate it about 1100 hours, 5 August 1952. Since no ice had been available for field ice chests, the sandwich ingredients had been at environmental temperature for five to nine hours and at body temperature or higher for seven to eleven hours! This in the hottest part of summer!

The picture was complete. A classical epidemic of food poisoning bearing all the earmarks of the staphylococcal variety! It seemed highly probable that the food became contaminated during preparation by the unhygienic mess personnel in the field kitchen.

One final piece of evidence nailed the diagnosis down and verified the conclusion arrived at by deduction. An alert aid man had secured one of the suspected sandwiches and took it to the field hospital laboratory when he delivered a patient there. The laboratory later reported a heavy growth of beta hemolytic *Staphylococcus aureus*. This was a lucky chance, for all the sandwiches had been eaten or thrown away by the time the surgeon arrived upon the scene.

On the basis of his investigation, days before the laboratory report filtered through to the surgeon, he was able to make logical recommendations to prevent repetition of the incident. Suspect personnel were removed from all messes and strict compliance with field food-handling procedures was insisted upon. No further trouble occurred and the 100 mile march finished in triumph.

DISCUSSION

Procedure to be followed in investigating food poisoning outbreaks has been epitomized in SR 40-930-1. In the situation described the investigation fell short of the ideal (as it will in most instances), but nevertheless was successful. Distance from laboratory facilities, time elapsed before the investigation begins and total disposition of the suspected food may cause the investigator to throw up his hands. Yet these are not insurmountable obstacles.

The fact that everyone in the exposed group becomes ill simultaneously is the sine qua non which differentiates food poisoning outbreaks from other transmissible enteric infections. When cases crop up in twos and threes and patients report in ill over a period of days it is quite a different entity one is dealing with.¹

Dack² describes in detail the courses followed by different types of food poison-

ing. When the onset of symptoms follows within two hours after the meal, the diagnosis is almost certainly staphylococcal contamination of the food if chemical and exotic food poisons can be eliminated. The enterotoxin elaborated by the staphylococcus is the irritant. It is present in the contaminated food when ingested, hence the rapid onset. With salmonella and alpha streptococcal enteritis following ingestion of infected food there is an incubation period. Symptoms are delayed seven to twelve hours.³

In the outbreak related investigation established that:

1. All affected became ill simultaneously.
2. All affected ate ham and cheese sandwiches.
3. Onset of symptoms followed almost immediately after ingestion of the noon meal.
4. Violent vomiting and diarrhea of relatively short duration were cardinal symptoms.
5. There was opportunity for contamination of the food by unhygienic mess personnel.
6. Conditions favoring bacterial multiplication were present (adequate time elapsed at temperature suitable for incubation).

The conclusions to be drawn from these few facts are practically inescapable. Bacteriologic confirmation was welcome but not vital.

It was not possible to prove where in the course of preparation the staphylococcus gained access to the sandwich filling. Ham is always suspect where refrigeration is not available. But in this instance one can imagine the assistant cook with oozing acne perspiring profusely over his work as he mixed ham and cheese on a warm summer night. The probability is greatest that contamination occurred then.

When probing a food infection epidemic certain items on the menu should make the investigator's ears prick up. These are ham,

chicken, turkey, chopped and ground cooked meats, meat and egg sandwich fillings, cream and custard fillings, potato salad, bread puddings, meat hashes and defrosted quick-frozen foods.

An outbreak such as this presents an unparalleled opportunity to drive home the lessons of sanitary food handling. In a letter to all commanders concerned the regimental surgeon traced the outbreak and made these recommendations:

1. All mess personnel read and adhere to Par 128, Sec XVIII, TM 10-405 (This states, "Ground meat and egg or cheese spreads are dangerous as sandwich fillers unless prepared just prior to serving. Sandwiches to be issued to troops in the field for future consumption should be generally of non-protein foods unless generous amounts of ground pickle mixture containing vinegar are used as a filler with them. No mayonnaise or other cooked dressing should be used.")
2. Mess personnel should be inspected daily before starting work to insure that hygiene is good and no active infections are present. Acne with pustular lesions is sufficient cause to keep a man out of the kitchen. Precautions should be doubled when going into the field as all other sanitary facilities are curtailed.
3. Every effort should be made to bring good refrigeration into the field when the situation permits. When it is not feasible full cognizance of its absence must be taken. Techniques of food handling and the actual foods prepared will be completely different than when in garrison. (Chaps 6 & 7, TM 10-402).
4. Bag lunches, if it is necessary that they be prepared many hours in advance, might better be carried in cooled insulated food containers (marmite cans) on a single vehicle and not be distributed until meal time.

SUMMARY

An outbreak of gastroenteritis occurred in a unit undergoing field training. An investigation conducted by the regimental surgeon while the unit was on the march was successful in identifying the nature and probable source of the infection. The approach to such a problem and measures which can be taken to prevent its occurrence are discussed.

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- ¹ Ingalls, T. H. and Britten, S. A.: Epidemic diarrhea in a school for boys. J.A.M.A. 146:710-712, 23 June 1951.
² Dack, G. M.: Food Poisoning, 2nd edition, University of Chicago Press, Chicago, Ill., 1949, pp. 80 to 161.
³ Tomsovic, E. J.: Epidemiologic study of an outbreak of gastroenteritis. Med. Bul. of the European Command 8:541-543, December 1951.



BOOK REVIEW

THE HUMAN MACHINE. By Captain Charles W. Shilling, MC, U. S. Navy, United States Naval Institute, Annapolis, Maryland. Published by The United States Naval Institute. Price \$5.00.

In this book the author deals with his subject, the body and its environment, as a machine. This is an understandable and realistic approach as the book "was prepared to meet the specific needs of the Department of Hygiene at the United States Naval Academy." In this machine age most persons, certainly Naval Cadets, should be attracted to a mechanical approach in the study of such a complicated machine as the human body.

The book is divided into three parts: Part One deals with the *Construction and Operation of the Human Machine*; Part Two with *The Preventive Maintenance and Repair of the Human Machine*; and Part Three with *The Human Machine as Part of the War Machine*.

In the seven chapters of Part One the author deals first with the nitrogen and carbon cycles, then takes up the various systems of the body, comparing them to such things

as a chemical laboratory, a transportation system, and a communication system. Food, minerals, and vitamins are dealt with as necessary substances to run and maintain a machine.

In the six chapters of Part Two the author covers such subjects as the common diseases, the alcohol and drug problem, life expectancy, causes of mortality, immunity, sanitation aboard ship and ashore. There is a chapter on Oral Health written by Captain C. W. Schantz, DC, USN; and one on First Aid by Lieutenant Horace Y. Seidel, MC, USNR.

Here is a well written, well illustrated book, many of the illustrations being of the cartoon type for emphasis to the lay person. There are many valuable tables. In the author's words the "Style of presentation has been kept informal with a minimum of medical and technical terminology." Admiral Joy states in the Foreword: "Its value and usefulness to people of all Services generally will be apparent." In this the reviewer heartily concurs.

COL. ROBERT E. BITNER, USA, RET.

Application of Ultrasonics to the Surgical Problem in Operative Dentistry*

By

COMMANDER ARNE G. NIELSEN (DC) USN†

(With three illustrations)

Dental caries is the most prevalent disease of our time. Control of the disease is approached through preventive measures and through treatment; and research is continually being conducted in both these fields. Dental treatment involves surgical procedures, and research along this line is being directed toward improved methods for cutting the hard tooth structure. One method currently under investigation involves the use of an ultrasonic mechanical vibration instrument in conjunction with an abrasive slurry. The investigation to date has produced an instrument of suitable size for preclinical testing. Exploratory cutting tests have revealed that this modality will cut hard materials, but that the instrument is erratic and unpredictable in performance. Biologic studies are being conducted, but results are not yet available. Instrument refinements and information about the biologic effect of instrument use are needed before clinical testing can be attempted.

THE most prevalent disease of our time is dental caries. Statistics¹ indicate that the great majority of the U. S. population are victims of this malady. Those afflicted are subject to pain, infection—both local and systemic, and finally the loss of the tooth or teeth involved. The patient suffers a loss in masticating function and requires artificial replacements with all their accompanying inadequacies. In addition, decayed teeth, or spaces left by the loss of teeth, become aesthetic problems and may create in the patient associated psychologic problems. The only satisfactory way to cope with the magnitude of the dental caries problem is through preventive measures rather than treatment of the carious lesions after they become manifest.

Dental research is being continually conducted, therefore, toward the development of preventive measures. Substantial progress has been made toward this end despite the

small amount of money spent on it. For instance, only about two thirds of 1 per cent of the total U. S. Public Health medical research budget is allotted to its dental research program.² Two outstanding results of dental research are the fluoridation of drinking water and the development of certain caries-reducing diets. The disease of dental caries is not as spectacular as cancer, heart disease, muscular dystrophy, anterior poliomyelitis, and the host of others; nevertheless many man hours which represent an important part of the national wealth are lost because of this disease.

Until preventive measures eradicate dental caries, the dental profession has the continuing problem of treating the disease. To date the most satisfactory treatment for the lesions of the hard dental structures is the surgical removal of the diseased tissue, the preparation of a cavity according to accepted precepts, and the placement of artificial material to restore the tooth to function and anatomic form.

The surgical removal of the hard dental structures presents problems to the operator and the patient. First, the operator must remove, in addition to the diseased tissue, enough of the unaffected tooth substance to fulfill the requirements of accepted cavity preparation design. Current methods em-

* Presented at the 61st Annual Convention of the Association of Military Surgeons of the U. S., Hotel Statler, Washington, D.C., Nov. 29-Dec. 1, 1954.

† U. S. Naval Dental School, Bethesda, Maryland. The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

ployed in the removal of hard dental structures present certain objectionable features from the patient's point of view. Rotary instruments, in spite of the development of considerate techniques, generate heat which is a source of pain. The use of local anesthetic agents has to a great extent eliminated pain, but many patients have an aversion to the use of the needle. In spite of the use of local anesthetic agents, the possibility of thermal trauma to vital tissues and the development of postoperative complications remain problems. In addition to the thermal problem inherent with the use of rotary instruments, there is the problem of vibration and bone-conducted noise which is annoying to the patient and which cannot be eliminated through the use of anesthetic agents.

Current methods used to accomplish required surgical procedures for restorative treatment are time consuming to the operator and patient, and consequently make treatment a costly procedure. The objectionable features of dental treatment have created a reluctance to seek it, and in many cases an actual fear of it; as a result, many individuals deny themselves the benefits of complete dental care and in time become dental cripples. As such, they require more costly complete or partial dental prosthetic appliances to restore their mouths to near normal functional efficiency. The dental profession is keenly aware of the inadequacies of current surgical procedures and is constantly seeking improved methods.

The recent employment of rotary instruments with increased speeds and light pressure has minimized the objectionable features of surgical procedures. Also the use of a technique employing an abrasive powder with a gas propellant has had satisfactory patient acceptance, but it presents limitations for the operator. A most interesting development is the application of a commercial process,³ utilizing ultrasonic mechanical vibration with an abrasive powder/water mixture, to the cutting of the hard dental structures. For several years ultrasonic mechanical vibration used in conjunction with an abrasive slurry

has been applied commercially to the cutting of hard materials. Early in 1953 an investigation was initiated at the U. S. Naval Dental School in conjunction with the U. S. Naval Medical Research Institute to explore the possibilities of this new cutting method as applied to operative dental surgical problems. A vibration instrument of suitable size was built for preclinical testing. A report of the instrument's development was presented to the International Association for Dental Research at French Lick, Indiana, March 20, 1954.⁴ The instrument (Fig. 1), a magnetostrictive device, was constructed from a nickel tube with one end of it shaped into a cutting tip. By electrical means, the tube was made to vibrate longitudinally at a frequency above the range of human hearing, hence the use of the word ultrasonic in describing the instrument. Cutting was accomplished by applying the vibrating tip and the slurry to the material to be cut. The stroke or amplitude of vibration of the cutting tip was computed to be approximately 10 microns.

As soon as a vibration instrument was available, an investigation was begun into the biologic and physical aspects of the process to determine its role in operative dental procedures.

Studies of the biologic effect of the new cutting method are being conducted on animals, but the results are not yet available because of the time requirement for the accumulation of scientifically sound data. Any clinical applications must be deferred until biologic data indicate the new method is safe for use. Several exploratory studies were undertaken to furnish information about the physical characteristics of the cutting method.

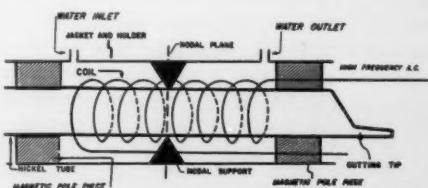
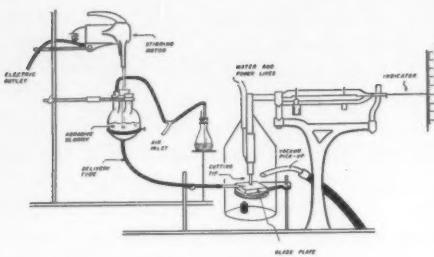


FIG. 1.



LABORATORY SET-UP FOR PHYSICAL TESTING

FIG. 2.

The results of these studies were presented to the annual scientific session of the American Dental Association at Miami, November 9, 1954.⁵

The laboratory setup used for the physical studies is shown in Figure 2. It provides a means of controlling the pressure applied, the powder/water ratio of the abrasive slurry, and the slurry delivery. It also provides a means of measuring the relative depth of cut.

The first study conducted dealt with the effect of pressure on cutting rate. The instrument was mounted as shown in the illustration. One minute cuts were made in accurately weighed glass plates at pressures ranging from 20 to 500 grams. The loss in weight of the glass plate was taken as a measure of the cutting rate. (The nickel tube of the instrument is known as a transducer because it converts electrical energy to mechanical energy.) Two other identical transducers were used to make similar series of cuts. The results of all three series were charted. At pressures up to 150 grams, the cutting rates in each case increased in proportion to pressure. At higher pressures each transducer reacted in a different manner. There was no apparent relationship between cutting rate and pressure. Performance was erratic. It appeared that unrecognized variables were operating to produce such dissimilar instrument performances. No attempt has been made to draw conclusions about the effect of pressure on cutting rate.

The second study was undertaken as a result of the first in an effort to find one of

the possible variables. This study was made to determine how cutting rate varied with the time of cutting or use. With the same laboratory setup as before, spot checks of the cutting rate for two transducers were made over a period of 40 minutes. The pressure was maintained constant at an arbitrary figure of 150 grams. The cutting rate of one transducer, although varying, was consistently low. Efforts to increase the cutting rate failed. The other transducer exhibited improved cutting with use, up to a point, after which it became erratic. Here again, as in the pressure study, the results produced with one transducer could not be produced with another. Perhaps the variation in transducer performance with use was one of the factors responsible for erratic performance in the pressure study.

A third study was initiated to observe the effect on the cutting rate of various powder/water ratios for the slurry. The same laboratory setup was used as before, and pressure was maintained constant at 150 grams. The cutting rates for various powder/water ratios were determined and charted. The curve indicated that the cutting rate for the 10 per cent slurry was slightly better. Here again instrument performance varied with use.

The material cut in the previous studies was glass. A fourth study was undertaken to observe the cutting rates in various other materials. The laboratory setup was modified to measure the relative depth of cut. One minute cuts were made in the test materials under constant pressure and with a slurry containing 10 per cent powder. The relative depths of penetration were charted. Silicate cement and zinc phosphate cement were cut most readily, and glass, dentin, enamel, and amalgam were cut about one third as readily. The cutting rates for plastic materials and inlay gold were the lowest.

The slurry used for the previous four studies was aluminum oxide having an average particle size of 30 microns. A fifth study inquired into the cutting rate of various abrasive agents for the slurry. The usual laboratory setup was employed. Cuts were made in

glass at constant time and pressure. It appeared that the particle size affected the cutting rate more than the nature of the abrasive agent. Most satisfactory cutting rates were obtained with agents having a particle size between 16 and 66 microns. Less satisfactory cutting rates were obtained with agents whose particle size was outside this range. It may be noted that the standard slurry used for these studies falls in the most satisfactory range.

One other exploratory test was made to investigate the amount of heat generated within a tooth in response to this cutting method. A thermocouple was placed in the pulp chamber of an extracted tooth (Fig. 3), and cuts were made into the opposite tooth surface as shown. The temperature increased as the cutting approached the thermocouple, and reached a maximum of 20° F. This study is inconclusive, but it indicated that heat is generated by this method of cutting. Whether it is sufficient to warrant clinical concern must be determined by further study.

Conclusions. It is evident that cutting of the hard dental structures can be accomplished by this modality. The instrument used

in these studies has limitations and its performance is erratic and unpredictable. These limitations must be resolved to produce a practical instrument. Furthermore the biologic effect of the use of this modality must be scientifically determined before clinical applications are made.

It is hoped, for the good of all concerned, that this new cutting method will prove to be clinically acceptable, and that it will encourage dental patients to seek early dental treatment.

Summary. This paper presents a new approach to the surgical problems associated with the treatment of dental caries. The ultrasonic vibration process has been shown to be a practical method of cutting hard substances. Exploratory tests of the cutting rate reveal that the instrument in its present stage of development is erratic and unpredictable. Instrument refinement and a thorough evaluation of the biologic effect of its use are necessary before it can be used clinically.

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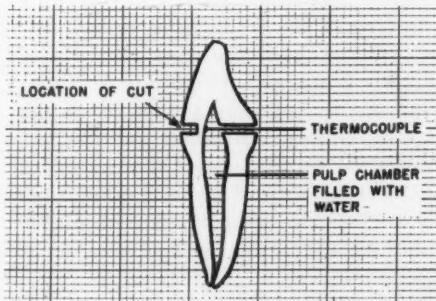


FIG. 3.



The Training of Armed Forces Veterinary Officers in Veterinary Radiological Health*

By

LT. COLONEL BERNARD F. TRUM, VC, USA†

BEFORE the 60th Annual Convention of Military Surgeons a paper "De-contamination of Food after Atomic Contamination"‡ was concluded with the statement that "decisions for satisfactory disposition of radioactively contaminated foods can only be made by specially trained food inspection personnel after the biologic and radiologic characteristics of the contaminating elements have been considered." Officials of various agencies of the Federal Government charged with aspects of food inspection inquired immediately concerning the number and location of such trained personnel and the facilities for training additional ones. A training program to meet the needs of the veterinary services was not available although both civilian and military veterinary services are responsible for safeguarding the health of animals and derived food products.

It has been realized for some time that decisions, either military or civilian, are often not made by those best qualified in the field but by the best qualified in the immediate vicinity at the time the decision must be made. Therefore, it is imperative that staff officers have accurate, detailed information upon which to base recommendations in an emergency situation. Personnel expected to render decisions pertaining to radiological health should be well oriented in the principles of nuclear science.

On March 1, 1954, radioactive particles fell on the Japanese fishing vessel "Lucky

Dragon" as she lay in the Pacific about 75 miles from Bikini. Contaminated fish created a problem second only to the anxiety felt for the exposed fishermen. The incident illustrated that it is not sufficient merely to have men qualified in radiological health; it is preferable and highly desirable that some of the trained personnel belong to a corps of officers qualified by training and experience in all aspects of handling, preparation, processing and marketing of food and charged with the responsibility of food inspection.

To provide generalized training, a course in radiological health specifically designed for veterinary officers of the Armed Forces was established. The course is given at the Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tennessee, with veterinary officers assigned for research and training at the University of Tennessee-Atomic Energy Commission Agricultural Research Program co-operating.

The course is of two weeks' duration and comprised of an orientation in nuclear physics, radiochemistry, principles and practice of health physics and radiometry. The properties, characterization and decay of radiation together with the interaction of radiation with matter are explained. Demonstrations, laboratory exercises, seminars and conferences are held to observe and discuss the effects of ionizing radiation on unicellular life and mammals. Emphasis is placed on detection of radiocontamination of foods and principles of decontamination. The effect of fall-out on foods and food producing animals following a nuclear detonation and the use of ionizing radiation for the sterilization of foods are subjects of practical problems covered in course.

The Chiefs of the Veterinary Services of the Army and Air Force plan to send

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† Medical Research Laboratory, P.O. Box 142, Oak Ridge, Tenn.

‡ Published in the *Military Surgeon*. See Vol. 114:111, Feb. 1954.



STUDENTS IN THE COURSE OF VETERINARY RADILOGICAL HEALTH AT THE
OAK RIDGE INSTITUTE OF NUCLEAR STUDIES

Front Row, Left to Right—Col. James R. Karr (Air Force), Hqs. ATC; Col. Philip R. Carter (Army) Meat and Dairy Hygiene School; Dr. Ralph T. Overman, Chairman, Special Training Div. ORINS; Dr. Charles S. Shoup, Chief, Biology Branch, AEC, Oak Ridge; Col. Robert R. Miller (Air Force), Hqs., ADC; Col. William E. Jennings (Army), Brooke Army Medical Center.
Back Row, Left to Right—Lt. Col. Bernard F. Trum (Army), Course Director; Lt. Col. William B. Snodgrass (Air Force), Hqs. SAC; Lt. Col. John R. Nettles, Jr. (Air Force), Hqs. TAC; Col. William M. Van Sant (Air Force), Hqs. AMC; Lt. Col. Marley C. Clark (Air Force), Andrews AFB; Lt. Col. Jack H. Hempy (Air Force), Office of the Surgeon General; Lt. Col. Walter T. Carll, UT-AEC, Oak Ridge (Army); Col. Curtis W. Betzold (Army), Office of the Surgeon General; Maj. U. S. G. Kuhn, III (Air Force), Course Director.

many veterinary officers to the Oak Ridge Institute of Nuclear Studies for orientational training in veterinary radiological health. Veterinary officers with special aptitude and a desire to specialize in veterinary radiological health will be selected for definitive and comprehensive training.

A comprehensive training can be obtained in special courses in radiation physics at several universities at which Atomic Energy Fellowships are granted. Following nine months at these schools a three months' training period is accomplished at one of the Atomic Energy Commission laboratories at Oak Ridge, Tennessee, Brookhaven, New York, or Hanford, Washington.

All veterinary officers comprehensively trained in radiological health have attended a course in advanced radiobiology offered by the Armed Forces Special Weapons Project. At the present time this course is com-

prised of a six months' academic curriculum at Reed College, Portland, Oregon, followed by three months' training at Oak Ridge, Tennessee. The course of instruction offered at Reed College embraces studies in genetics, biochemistry, mathematics and statistics, nuclear physics, electronics and radiometry. At Oak Ridge students receive two months' instruction in applied health physics and one month in radioisotope techniques. Veterinary officers completing this course are assigned to research groups to work in that area of particular interest to the military services—radiobiology. It is considered imperative that officers be associated with a group working with the effects of atomic detonations or with university or other research groups working in radioisotope research, or the biological aspects of total body irradiation. At the present time the Air Force has veterinarians at Oak Ridge, Tennessee, working

on the effects of total body irradiation and toxicology of tracer elements. In addition an Air Force veterinarian at the University of California is concerned with other aspects such as latent effects of radiation. The Army has veterinarians at the University of Chicago and University of Tennessee-Atomic Energy Commission Program at Oak Ridge. At the latter installation they are conducting studies on the effect of total body irradiation of large animals, radiotoxicities and wholesomeness of irradiated foods of animal origin.

Close cooperation with the Atomic Energy Commission facilities and officials at these installations makes possible the participation of Armed Forces personnel in this type of training. Excellent working relationships have been established and participation by veterinarians in Atomic Energy

Commission activities has proven to be mutually beneficial to the Commission and the Department of Defense.

The veterinary profession should exert continuing efforts to appreciate the full impact and importance of nuclear science. The first responsibility of veterinary officers to prepare and train military personnel for defense should not abrogate their responsibilities to the civilian veterinary profession. To enhance such action and give impetus to training in veterinary radiological health in civilian veterinary educational institutions, members of the veterinary faculties who are members of the Veterinary Corps Reserve will be extended every opportunity to participate in this course of instruction as soon as spaces within established quotas are available.



WHEN FREEDOM FAILS

No man escapes, when freedom fails
The best men rot in filthy jails;
And they who ordered, "appease, appease,"
Are hung by men they tried to please.

—HIRAM MANN

Status of the Medical Service Corps of the Air Force, Present and Future*

By

COLONEL PHILLIP G. FLEETWOOD, USAF (MSC)†

I BELIEVE it would be appropriate for me to begin by giving you a little history of the Medical Service Corps of the Air Force. Our Corps came into being as a part of the U. S. Air Force Medical Service on 1 July 1949. Initially, our personnel were obtained by transfer from the Army. We started with 733 officers. The Corps structure is not prescribed by law but it is administratively provided for by an Air Force General Order.

Within the Medical Service Corps we have a total of eleven (11) specifically identified specialties. These are Medical Administration; Medical Supply; Pharmacy; Optometry; Sanitary and Industrial Hygiene Engineering; Medical Entomology; Nutrition; Clinical Laboratory; Aviation Physiology; Psychology; and Psychiatric Social Work. I have had a chart prepared which depicts a break-down of our Corps by authorizations and present strength in each specialty. For easy presentation, I have made consolidations of the different levels within specialties. Our authorizations and strength by specialty follow:

Specialty	Authorized		On Hand	
	1 Oct. 1954	1954	1 Oct. 1954	1 Nov. 1954
Administrative	1072		1049	
Supply	402		411	
Pharmacy	12		14	
Optometry	110		105	
Engineering	120		90	
Entomology	15		11	
Nutritionist	2		2	
Clinical Laboratory	121		121	
Aviation Physiology	28		29	
Psychology	40		39	
Psychiatric Social Work	23		17	
Totals	1945		1888	

The authorizations I have cited above are those contained in Air Force Manning Docu-

ments. Undoubtedly, a few of you know that we are not always allowed to have a sufficient number of officers to cover all personnel spaces desirable. This is the case so far as our MSC manning is concerned. We operate under a so-called ceiling, which currently permits 1910 officers. This means that from a staffing standpoint we have to plan on under staffing to the extent of thirty-five (35) personnel spaces for the remainder of this fiscal year.

Our current strength by grade is 21 Colonels, 19 regular and 2 reserve; 103 Lt. Colonels, 57 regular and 46 reserve; 332 Majors, 106 regular and 226 reserve; 379 Captains, 51 regular and 328 reserve; 1053 Lieutenants, 67 regular and 986 reserve. Our summary shows that we have 300 regular officers and 1588 reserve on active duty, for a total of 1888. Of the total of 1888 officers our last summation reveals that approximately 65% are career officers. These are the individuals who are in regular status or reservists who have signed indefinite service agreements. I am particularly proud to report to you that our Corps is better off stability-wise than any of the other officer components in the Air Force Medical Service. Since I believe officer stability is one of the most important, if not the most important single item in the development of a good Corps structure, I am spending considerable time in attempting to have more of our officers select the Air Force Medical Service on a career basis. I think it is very possible that more of our personnel will select the Air Force on a career basis. As of today, I

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† Chief, Medical Service Corps, U. S. Air Force.

feel that our ratio of career officers versus non-career officers should be changed from 65% to at least 80% as soon as practicable.

Educationally, we are making steady progress. At the last summation 52% of our total strength had a college degree and 17% of the total strength had two years of college or more. As of today, 2% of our personnel have reached the doctorate level and 8% are at the master level. We support formal training courses on a continuing basis. For example, we have twenty-five (25) officers attending civilian college courses and 25 officers attending courses in hospital administration in military schools; 10 of this latter group are in a course conducted by the U. S. Naval School of Hospital Administration, National Naval Medical Center, Bethesda, Maryland, and the remaining 15 are attending the Hospital Administrator's course at the Brooke Army Medical Center, San Antonio, Texas.

A very special effort is being made in the Air Force to save the productive time of physicians through the maximum utilization of MSC officers. At the same time, we are doing everything possible to reduce to a minimum those administrative practices and reports, commonly referred to as paper work, that are not considered essential for the operation of the Air Force Medical Service. We use the team concept in every area. In

order to save the productive time of our ophthalmologists we use the ophthalmologist-optometrist team concept. With this system our optometrists relieve the ophthalmologist of many of his duties and responsibilities which allows him more time to devote to the treatment of pathological conditions of the eye. Another example, is the psychiatrist-psychologist-psychiatric social worker team. As you probably know the psychologists and the social workers on such teams are MSC officers while the psychiatrists are physicians. We are making a very special effort to save physician-time in the administrative field. One of our larger problems is that of having a sufficient number of experienced MSC officers. This problem will eventually be solved when our Corps becomes a little older and we have a greater number of career minded personnel. I believe we have the potential to do much more in all para-medical fields as we grow and obtain the experience so necessary. It is a real pleasure for me to be a part of the Air Force Medical Service team. I enjoy my work and I am sure we are making progress. All of our officers are enthusiastic about their work and anxious to do their jobs as well as possible. To participate in our accomplishments is a privilege and an honor in which every MSC officer can take justifiable pride.

Planning for Study of the Quality and Cost of Nursing Service

By

KATHRYN B. WOLFE*

Veterans Administration

CHARLES KETTERING has defined research as an organized method of finding out what you're going to do when you cannot keep on doing what you are doing now. About a year ago, we determined that we could no longer continue to use the methods we were using for estimating the numbers and kinds of personnel required to provide nursing care to patients in our hospitals. These methods were no longer adequate because of the many changes in medical, hospital and nursing care programs.

It was imperative that a factual basis for estimating the nursing budget be developed. New and better ways of determining personnel required to provide a desired quality of nursing were needed and should be established through the process of critical investigation. So began the idea of studying the quality of nursing service as related to cost.

It has been stated that the purpose of research is to discover answers to meaningful questions through the application of scientific procedures. So the first step in our plan was to state our problems in the form of questions. The questions we seek answers to are these:

What are the identifying characteristics of good quality nursing care and can these characteristics be measured in terms of the amount and effect of nursing care provided?

What types of workers and how many of

each type will be required to provide this quality of nursing service?

How much will this quality of nursing service cost?

What are the factors which increase the cost of nursing service without improving the quality of the service?

How might the identifying characteristics of good quality nursing be used for self-evaluation and self-improvement by hospital nursing services?

We considered these to be meaningful questions for which answers are not now available but for which we might find the answers through the use of scientific study methods.

A nursing committee was formed for the purpose of planning and organizing the study. Resources within the Veterans Administration were assessed and assistance was sought from the Controller's Office and the Division of Research and Education. The Controller's Office made two members of the management development service (a Cost Analyst and a Management Analyst) available to the Committee and the Division of Research and Education has provided an expert in study methods. Assistance from other segments of the organization will be included as the study progresses.

A review of current literature and nursing studies was started and is continuing as a means of learning what knowledge is already available and what can be used for our purposes, thus avoiding duplication of effort.

The pathway from ideas to new concepts, new standards and new practices is tortuous and uncharted. It has many bypaths and to miss the right road may result in serious delay or even failure to arrive at the desired

* Chairman, Program Planning and Development Committee of Nursing Service, Veterans Administration, Washington 25, D.C. Presented at the Nurses' Section at 61st Annual Convention of Military Surgeons of the United States. Hotel Statler, Washington, D.C., Nov. 29-Dec. 1, 1954.

goal. Realizing the interdependence of each of the closely related activities of a research project, an adequate research plan was considered essential.

The guidance of research specialists was deemed necessary. A conference was arranged with such a group for the purpose of discussing the problems to be studied and of seeking their interest and assistance with the project.

The research group expressed interest in the problems we desire to investigate and a willingness to work with us. We provided them with informational material relative to our organization which would give them a background of information and understanding essential to their participation in the study.

This conference resulted in clearer understanding and statement of the purpose of the study, consideration of the scope of the study and a basis for future planning.

Preliminary to the study proper, it was determined that several steps were essential and should be taken. One, that a study of the status quo in Veterans Administration Nursing Service should be made relative to the extent to which VA Nursing personnel are performing nursing functions and the present cost of VA Nursing Service as related to quality, utilization and other factors assumed to influence the cost of Nursing Service; and two, to define nursing for VA Nursing Service and on the basis of this definition, formulate policy regarding what are nursing functions in VA Nursing Service and who shall perform these functions.

In order to evaluate the status quo of our service an analysis is being made of the utilization and cost of nursing service and the relationship of certain factors assumed to affect utilization and cost. The factors used are:

The size and type of the hospital.

The type of construction—cantonment or vertical.

The kind of medical care programs.

The kind and amount of research programs.

The daily average patient load.

The type and degree of illness.

The patient turnover rate.

The relationship of nursing costs to overall hospital costs.

The composition of nursing personnel—the ratio of professional to non-professional workers.

The employee turnover rate.

Kind and quality of in-service education programs.

A questionnaire was used to collect significant data relative to utilization of nursing personnel. A date was specified for collection of this data from each of the 172 Veterans Administration hospitals. The data collected has been analyzed, interpreted and related to present nursing costs.

An analysis of the cost data available in the Central Office was made and the present cost for nursing personnel was so determined.

A judgmental opinion of the present quality of nursing service will be made.

The significance of all these related data will be used as a basis for selecting VA hospitals to be studied.

The present plan includes the selection of nine hospitals, three general medical and surgical, three tuberculosis and three neuropsychiatric hospitals. Within any type, one will be selected from high cost, one from medium cost and one from low cost Nursing Services.

A director will be selected for the study in each hospital from the nursing staff of that hospital. Other personnel for the study are to be allocated and specially trained. Plans will be developed to meet these training requirements.

The design for the study is being developed and study methods are to be tested in one hospital in which we will pilot the project before involving the other hospitals selected for the study.

An organizational structure designed to indicate the functions, authority, responsibilities and relationships of the two organizations—consultants and VA Nursing Serv-

ice—is being developed. It will provide for channels of communication to permit exchange of information and close coordination to assure maintenance of a plan understood and guided by the two organizations and interpreted in policies known and understood by those involved in executing the research plan.

The value of a schedule as a guide for action and a basis for measuring accomplishment has been considered. Such a schedule will be used even though it may be subject to change due to unpredictable occurrences.

Brief reports will be made as the study progresses. These reports will be a means of providing information and evaluating the progress of the study. A final report of the study will be written.

Setting up a budget and making other necessary arrangements within the over-all financial plan is essential. A budget for consultation services has been established and a contract has been arranged for such services. Because of the limited funds available, it is necessary that a major part of the personnel services required for the study be

furnished by persons on the staff of the Veterans Administration. The budget for the future will perhaps depend upon recognition of the potential value of the study; the organization's responsibility for such a study and its ability to finance the study. The amount of money available may be one of the controlling factors and may determine what will be studied and the extent of the study.

We are in the initial phase of our study and the planning about which I have been speaking to you is the general over-all plan which will provide for the organization and administration of the study. Woven throughout our planning have been other elements essential in such a venture, these are: faith that the philosophy which initiated the study will carry it to successful conclusion; hope that the findings will provide us with better means of solving our problems.

Good organization and good administration of a research plan is essential to its success. It has been said that efficient administration of research provides, "Horizons Unlimited."



Armed Forces Day and the Medical Professions

By

COLONEL SHELDON S. BROWNTON, USAF (MC)

Director for Planning and Liaison Office, Assistant Secretary of Defense (Health and Medical)

ARMED FORCES DAY! These three words hold a different meaning to every individual who has cause to give them thought. Some think of past wars with all the sacrifices and human suffering they have cost; others think of the honor being bestowed upon our present military forces, ever ready to protect our way of life; while we, in the health professions, must give thought to all the accumulative consequences we may be called upon to endure should this world ever be thrown into the chaos resulting from an atomic disaster.

During recent weeks this has been brought to our attention more forcefully than ever before by the release of the facts concerning the phenomenon of "Fall Out" following an atomic blast. Previous information made us consider the many medical problems which might result from such a blast—but only within a relatively small local area. The Federal Defense Administration with local and state organizations have developed plans to give the maximum care possible under those circumstances—now a re-evaluation is called for. To educate all individuals in the probable consequences of an atomic disaster and the measures they can take for protection against the insidious attack of radiation from "Fall Out" material, becomes a problem of increasing magnitude. The health professions must consider the means available to furnish the best care possible to the greatest number of persons. To accomplish this, special training is essential for our professional people not in the care of one patient, but of masses. Care of an individual by one physician from the time of injury to the point of

maximum benefit may not be possible. The patient may pass through many hands during the process of care and evacuation. Although this concept of treatment is foreign to our normal procedures in civil life, it is well-known to those in military medicine during times of conflict.

In order to instruct medical and dental students in these concepts so essential to medical practice under disaster conditions, a program has been inaugurated in several medical schools during the past three years known as "Medical Education for National Defense" and this is being expanded to additional schools in 1956. Instructors in various professional fields from the participating schools are afforded opportunities to visit research, teaching, and medical treatment facilities of the Armed Forces and other Federal agencies. This will enable them to learn at first-hand the medical problems facing these services and wherein they differ from those in civilian pursuits, and the problems encountered by man when required to live under environments strange to normal existence such as, in "speed of sound" flight, prolonged submarine activity, extremes of heat and cold. Medical care under mass casualty situations is demonstrated and discussed. At the discretion of the medical schools, any or all of the material presented during the faculty visits to Federal facilities may be incorporated into the curricula. Acceptance of this program by the student and faculty has been gratifying and strengthens the conviction that through such training the medical and dental professions will be better able to cope with any eventuality.

EDITORIALS

Heat Trauma

THE approach of summer should again bring to realization the need for measures to combat the heat and the ill effects of the direct rays of the sun.

Commanders of troops would do well to review with their officers, in cooperation with medical personnel, the lessons learned in care and acclimatization of troops in warm climates. Should these lessons not be reviewed in the spring of each year, and kept constantly in mind during the summer months, many unnecessary casualties might be expected with the loss of manpower, with suffering, not to mention the financial loss to the nation.

Officers exercising poor judgement by scheduling vigorous exercises in the middle of the days of the hot summer months may feel that they are hardening their men to the rigors of field duty. While it cannot be denied that a campaign in war time cannot be stopped in the heat of the day, still there is nothing gained but casualties, and such casualties occurring in peace-time manoeuvres or in training camps are inexcusable when so much is known now in their prevention. The incurrence of unnecessary casualties does nothing toward improving morale.

The articles appearing in this journal on heat trauma should assist the conscientious commanders who desire to prevent casualties that are apt to occur from the ill effects of heat. Army Special Regulation 40-260-5 should also be studied. A salient point made in that regulation is that the responsibility for recognition of heat injury is placed on the unit leaders.

With the cooperation of troop commanders and medical authorities the numbers of casualties in the service from heat should be greatly reduced.

Fluoridated Water

MOST of us are by nature reluctant to eat or drink anything supposedly unclean or adulterated. It would not matter that the impurity we attribute to food and drink might be just a figment of imagination. Things are taboo when they violate our personal, sometimes unreasonable, code of cleanliness and wholesomeness. While aggressive health education of the modern times further strengthened our demand for unadulterated goods, it also widened the area of biological misconceptions, superstitions and apparent conflicts in matters of hygiene and sanitation. Let's see, for instance, what the experts of health did to our most important daily beverage!

When after several decades of relentless campaign, public health authorities finally succeeded in convincing us about the blessings of pure drinking water, they turned about and seemingly abandoned their former doctrines. They conceived the theory, and designed the practice, of "treating" our main daily drink. Though it is sanctioned now by law, the growth of such practice was by no means without opposition, and the now universally accepted method of water chlorination had a very rough sailing at the start.

None of the public "adulterations" and enforced "enrichments" of AQUA PURA caused, however, so much ado, and stirred up so much controversy and bitterness among the experts themselves as the proposal to combat the decay of teeth in the young mouths of a town by the admixture of fluorides to the public water that is to be sipped by adult, middle-aged and older mouths, too. The idea of the fluoridation of public water supplies is not very old, but even its short course in history is highly instructive.

The *good effect* of fluorides upon the teeth

had been known since the last quarter of the 19th century. Potassium fluoride tablets had been already prescribed by the German Erhardt (1874) for the prevention of tooth decay in children and expectant mothers. The *bad effect* or the action of too much fluoride upon the teeth was first recognized in 1908 when McKay and Black described fluorosis or the development of mottled enamels in the inhabitants of certain areas where the drinking water contained an excess of fluorine compounds (near 7 mg per liter, or 7 parts per million). This condition was further examined by McKay (1925) and Churchill (1931).

Soon it was also recognized that *fluorides are essential* in the human household and their deficiency also causes trouble. In the 30's it became evident by comparative statistical methods that dental decay was much more frequent in children of those towns where little or no fluoride was in the drinking water than in those towns where the fluoride concentration of water was about 1 milligram per liter (or 1 part per million). Dean (1938) thus compared the neighboring populations of Quincy and Galesburg in Illinois. His studies were further confirmed by many others and with other pairs of U.S. towns.

Another set of experimentations followed in the 40's to show that the faulty waters can be corrected by addition of fluoride to the water to a concentration required for normal dental health. Such treatment of the water resulted in 60% to 70% reduction in the number of carious teeth of children in the formerly fluoride-deficient towns. The best known examples of town pairs from this set of experiments are: 1) Newburgh and Kingston, in New York State (1944-51); 2) Grand Rapids and Muskegon (1945); 3) Colorado Springs and Boulder, Colorado (1950). The results were always the same:—in the fluoride-treated cities the school children had fewer decaying teeth. The Colorado studies made also likely that adults might have some benefit from fluoridation of public water supplies.

Thus, the way was prepared for a more

general acceptance of fluoridation as a part of the routine treatment of drinking water at the municipal water works of American cities. A growing number of American associations now support the method as *the most effective measure to control tooth decay*. Among them we see the American Medical, Dental and Pharmaceutical Associations, the U. S. Public Health Service, and most of the health departments of the individual states. Pharmacists were recently urged to take the leading role in their own communities in making this unsurpassed preventive measure popular. There is a useful pamphlet on the subject (*Fluoridation as a Public Health Measure*, Wash., 1954), published by the American Association for the Advancement of Science; it presents a roundup of available scientific information on the still debated topic.

Of course, the spread of the practice of fluoridation meets many objections and many fears; it must also wrestle with an armada of good citizens who want to defend the U. S. constitution, or their own religious freedom against such "mass medication" and "interference with Nature" which to them is but an attempt to introduce "socialized medicine" into the land of the free. But the reluctance of the people is gradually overcome, sometimes by well directed propaganda, sometimes by the democratic process of voting, and sometimes by the scientific method of observation and experiments.

Thus, public health officers have shown that fluoridation of the public water supplies does not make us die earlier. They do not find any difference in the mortality rates of 64 U. S. cities, 32 of which have been "treating" their citizens by putting fluoride into the water. The National Cancer Society also assures us that the small quantity of fluoride in the drinking water does not cause cancer. The Commission on Chronic Illness pointed out at its 5th annual meeting in Chicago that over three million people in this country have been living in ordinary good health in communities where the drinking water naturally contains the amount of fluoride which elsewhere must be added at the water

works for the control of tooth caries. The Water Purification Division of American Water Works Association (AWWA) also guarantees that the prophylactic "adulterants" of our pure water, fluoride or fluosilicic acid, themselves are of the utmost purity.

In our country, the *legality of fluoridation* was often questioned, but the courts had constantly upheld the practice. Some of the related law suits are well known as those in California, Louisiana, and Washington State. Since some people considered that the introduction of this health measure deprived them of their personal liberty, the Supreme Courts had also taken side in the issue of the alleged violation of the Bill of Rights. The United States Supreme Court ruled last December that fluoridation of the water supplies does not involve any federal question worthy of consideration. Thus, no citizen should feel that his rights under the Fourteenth Amendment have been violated when the health authorities of his city would adopt this modern measure in a nationwide anticaries campaign. Yet, though 1029 American communities, with a population of over 20 million, are now fluoridating their water supply, there are newer and newer attacks against fluoridation, and there are still unconvinced communities. In the 1954 November elections, for instance, five communities were for fluoridation, but ten larger cities rejected it, among them Birmingham, Ala., Atlantic City, N.J., Greensboro, N.C., Salem, Ore., etc.

Fluoridation is now also a global question. The disputation about its value and dangers is world wide. Many countries have organized special committees for the scientific study of the efficacy of fluorides in the prevention of tooth decay, and many committees have repeated the American mass experiments and statistical comparisons with pairs of cities. In Chile, for instance, the problem of tooth decay and its relation to the fluoride deficiency of drinking water was first recognized in 1939 (Otte), but only after the 1948 Santiago meeting of the First Interamerican Conference on Sanitary Engineering did the

Chilean government officially take notice of the question. In 1952, the special "Comité Pro Fluoración" was established which in 1953 then arranged, according to American patterns, a study of the waters and decayed teeth of two neighboring towns: Curicó, and San Fernando. Similar progress of fluoridation was made in Puerto Rico, Venezuela, and other American states.

Among the European countries, Switzerland is leading in fluoridation studies. The Swiss Commission for Fluorine Research at Geneva has arranged a series of experiments with school children to ascertain the preventive value of fluorides in drinking water and in food, also as a medicament. For several months some children took small daily amounts of fluoride preparations (Zyma-fluor, and Ossopan), and they later seemed to have fewer carious permanent teeth than their untreated schoolmates. Among the teeth, the premolars were apparently the least protected by such fluoride medication. How the resistance of teeth is strengthened by fluorides the Swiss Commission surmised from another series of experiments with pregnant guinea pigs and rabbits. Injections of small daily amounts of sodium fluoride caused various thickening (osteosclerotic) and thinning (osteoporotic) changes in the alveolar bony tissue.

In spite of the fluoride-deficient waters in many municipalities there are still some waters in this country that have an excess of fluorides and will cause unsightly mottling of the teeth. The U. S. Army, for instance, felt the need to install a defluoridation plant for the treatment of the water supply at Camp Irwin, California. The plant now reduces the fluorides in the camp's drinking water from 9-12 mg per liter to about 0.6-0.8 mg per liter, or to an adequate proportion so that pregnant women and children have nothing further to be afraid of.

Fluoridation of water will undoubtedly be a universal practice in the United States in time, the same as chlorination is now, but the public mind is slowly convinced, at times, when it comes to matters for the public good.

Around the World

By

CLAUDIUS F. MAYER, M.D.

KABUL and the neighboring Afghan villages had been thoroughly dusted with DDT in the course of an *antityphus campaign* launched by the World Health Organization. Almost 20,000 homes, 302 mosques, 29 public baths, 1,294 horse-drawn public vehicles ("tongas"), and several million pieces of clothing, beds, and bedding were treated during the period. As a result, no case of rickettsiasis occurred in the dusted area though the entire *Afghanistan* previously succumbed to devastating epidemics of louse-borne typhus fever. Now, medical colleagues who hesitated to accept positions at the University of Kabul have nothing to fear any longer.

Afghanistan is about as large as France but it has only 12 million inhabitants, mostly Moslems who write chiefly Persian and speak Pushtu. Much had been recently done for the sanitation of the country, and the Minister of Health hopes that malaria will be extirpated in the next two years. Most of the Afghan physicians have studied abroad. With the aid of western scholars, a medical faculty opened and it is being brought up to modern requirements at Kabul University. Medical education is free.

In the countries of the *Eastern Mediterranean Region* of the World Health Organization, which includes the area from Pakistan to Lybia, and from Syria to Ethiopia, the distribution of physicians varies greatly. In *Iran*, for instance, there is one physician to 60,000 persons, while in *Israel* the rate is one doctor per 430 people (1953 figures). Israel became a state in 1948, and over 30% of its physicians immigrated afterwards. Of the 3,717 physicians in Israel, half of them older than 50 years, 700 are women. Most (80%) of the practitioners settled in towns.

Iraq's population of over 4½ million is cared for by 569 physicians (1945 figure);

308 are living in Baghdad, a town of almost half a million persons. One of the Iraqui doctors, a certain Lt. Colonel, recently joined the circle of our members; he is stationed in Kirkuk, an "oil town" with 20(?) inhabitants, situated at the very end of a railroad line from Baghdad, where the *Iraq Army Medical Service* is maintaining a military hospital. This place is southwest from the site where Americans are digging, not for oil but for ruins. An expedition of the Chicago Oriental Institute just found some ruins in northeastern Iraq. These represent the *oldest settlement known on earth*, dating from 7000 B.C. The old village is M'Lefaat, 25 miles east of Mosul. This is also the general area of ancient Nineveh. It is hoped that the expedition will also find traces of the ancient Assyrian medical knowledge among the now 9,000 years old ruins.

The doctor shortage in the Middle East is partly relieved by the work of nurses whose sphere of activity is widening in the countries of the Orient. As an example, instruction of the public-health nurses in screening of vision was inaugurated a few years ago in the Republic of *Lebanon* at the University of Beirut. Eight countries of the Middle East now regularly test the vision of school children.

The Middle East and the Mediterranean world remain of great strategic importance in the global fight both against diseases and Communism. At various points in this area new naval and air-force bases are being built to strengthen the friendly nations. On Dec. 1, 1954, the *General Headquarters of Britain's* forces were moved from Fayid in the Suez Canal Zone to the island of Cyprus. The Suez Canal Base continues to function, however, until 1961 (under civilian management) to give support to British interests in Kenya and Malaya. *Cyprus* is not very healthy for Britishers who, according to

recent medical studies, are six times more liable to contract *infectious hepatitis*, a common disease at the island, than Indian troops or the Cypriots themselves.

At the western exit of the Mediterranean, with strong U. S. support, the non-NATO Spain is overhauling its preparedness and rebuilding its forces for the defense of western ideology in the life of "coexistence" with Soviet Russia. The new *Hematology and Hemotherapeutics Department* in Madrid, with a network of regional posts and military laboratories, is just as essential in this preparedness as the chain of military hospitals, the air force and naval bases, and the rebirth of the Spanish fleet. In past centuries, Spain did not care much for military station hospitals, except near its frontiers; in inland garrisons, medical service for the soldiers was mostly obtained in civilian institutions. Today however, *station hospitals* are available in the larger Spanish towns as in Córdoba, San Sebastian, Sevilla, Saragosa, Jaca, Huesca, Villa Sanjurjo, Granada, Barcelona, Alicante, etc. The Central Hospital Gómez Ulla is in Madrid; a military hospital is in Tetuan, Spanish Morocco. Each branch of the Spanish armed forces also has its own *tuberculosis sanatorium*.

American interest in *Spanish sanitary conditions* is aroused by the official agreement that the air force bases will be manned by American technicians and specialists. The sanitary and health conditions of Spain greatly improved after World War II. This was evident during the 13th conference (Sept. 26-Oct. 2, 1954) of the *International Antituberculosis Union* in Madrid where it was reported, for instance, that from 1950 to 1953 the mortality of tuberculosis dropped by 60%. Similar decrease occurred in the rates of infant mortality, general mortality, incidence of leprosy and malaria.

The entrance into the eastern Mediterranean at the *Dardanelles* is guarded by Turkey whose position is thus quite important in the strategic picture of the world. The Dardanelles were under international control until 1936 when the Treaty of Montreux assigned

it to Turkey. Beside its small European portion, this country now occupies the greater part (about 300,000 sq. miles) of the Anatolian Peninsula where its 21 million inhabitants, mostly (90%) of the Turki race, occupy chiefly the coastal areas. Having kept its neutrality during World War II, Turkey was at peace with Russia until 1945 when the Soviet renewed its ancient claim for the control of the Dardanelles. Since February 1952, Turkey is a part of the western defense against Communism, and since July 1954 it is receiving aid to build airports, oil pipelines, naval bases, and a radar warning system. Turkey has now 9,500 physicians who are well trained in the ways of western medicine. Its medical institutions at Ankara and elsewhere are equipped with all modern facilities, ready to take care of the public health and medical problems of the country.

The problems are numerous and varied. About five years ago, *Q fever* invaded Turkey. Since then, this form of rickettsiasis spread all over the country. The human epidemic was followed by an epizootic wave of the disease among the numerous goats in Anatolia. The infection seems to spread by wool, feces of horse and camel, and by cow's milk, too. The education of people in health matters seems to be satisfactory, and the *Turkish press* keeps the laity well informed about the latest advances in western medicine. Thus, a few weeks after a government pamphlet described the wonders of ACTH in Washington, I was requested to interpret the Turkish letter of a clerk of Istanbul who wished to know whether the slow progress of his congenital blinding disease, a case of Leber's optic atrophy, could be stopped also by the marvel drug.

Istanbul will be host to the 18th session of the International Bureau of Military Documentation from August 28 to September 1, 1955. The meeting will study the three most urgent problems of military medical service: a) the protection of the services in wartime, b) the crisis of recruitment of young medical officers, and c) education and instruction in the military medical schools. The session

is connected with cruising and reconnaissance of the Eastern Mediterranean area (Aug. 17-Sept. 6).

While western defense is strengthening all the exits of the Mediterranean world, Soviet forces have developed a *Red Gibraltar* right in the middle of the region where it joins the Adriatic, which is a terrible threat to the Middle-East oil supplies of the NATO countries. In the summer of 1948, Soviet forces, *with the aid of the Albanian Enver Hoxha*, occupied the Bay of Valona and the rocky 7-sq.-mile *island of Saseno* in front of the bay. By 1952 they had converted the island into a Red submarine base for 100 units, a large-scale naval fortress with casemates, subterranean stores, etc., only 45 miles away from the Italian Adriatic shore, menacing the coastal line from Brindisi to Otranto (Strait of Otranto). The fortifications include hundreds of posts with heavy weapons on the Karaburun Mountain range, a radar station atop the Janina mountain peak (ca 3,600 ft), 3 aerodromes at Valona and nearby.

The arrangement of forces hither and yonder the Iron Curtain is not without parallel among the surgical specialties. A British surgeon (Ogilvie), in a delightful editorial recently compared the *Iron Curtain to the diaphragm* of the human body, and the hole in the Curtain to the hiatus through which the gullet passes. On the thoracic side are the thoracic surgeons, a little two conscious of Divine guidance; on the abdominal side are the general surgeons, eager to scrap the diaphragm as a political boundary between the two factions of the surgeons. By all means, the curtain should be kept as an anatomic and physiologic masterpiece, the

British doctor says.

The world lost Sir Alexander *Fleming* (1882-1955) who opened the modern era of antibiotics with the isolation of penicillin. Henri *Gougerot* (1881-1955), French dermatologist, will be remembered for the description of many obscure skin diseases (e.g., nodular allergodermia which is marked by the Gougerot triad). One of the oldest members of the Army Medical Service of Great Britain, Major-General Sir Francis *Treharne* (1858-1955) died on Jan. 30. His achievements are mostly related to 19th century British expeditions and wars in Africa. Sir Henry *Wade*, eminent urological surgeon, died on February 21, 1955.

La Cucaracha! Until now we thought that cucaracha is either the cockroach or a Mexican song and dance. News comes from the Canal Zone, however, that the 600-foot deep crack on Contractor's Hill,—elevation on the western side of the Gaillard (or Culebra) Cut of the *Panama Canal*,—had developed because the mass of the hill contains "cucaracha," a mixture of weak clay shales, sandstone conglomerate, conglomerate, welded tuff ash flow and other volcanic ejections. The crack was accidentally discovered in 1938, and since then kept under constant observation. A recent movement of this cucaracha formation is endangering the military usefulness of the Canal. (Formerly there had been about 30 slides of different kinds.) A Texan firm was employed last May to remove from the top of the hill almost 2 million tons of rock and cucaracha, by August 1955, to ease the pressure. Thus, the Canal, truly a bridge of water, will be saved for many more years as the mighty monument of the sanitary genius of General Gorgas . . . *Multa paucis!*

NOTICE

Copies of the January, 1955 issue of *Military Medicine* are needed by the Association. Please mail to Suite 718, New Medical Bldg., 1726 Eye Street, N.W., Washington 6, D.C.

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It is a privilege to list the firms who have joined The Association of Military Surgeons as Sustaining Members. We gratefully acknowledge their support.

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ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES

TO BE HELD

AT

HOTEL STATLER

WASHINGTON, D.C.

NOVEMBER 7, 8 AND 9, 1955

The Association is the only international society devoted to the military aspects of medicine, dentistry, nursing, veterinary medicine, and allied sciences. Noted speakers, appropriate ceremonies and a variety of entertainment will make this year's meeting attractive to attending members and guests alike. There will be an outstanding scientific program devoted to the latest advances and trends in the specialty of military medicine.

For the entertainment of the members and guests, a full schedule of events is being arranged. As in the past, one of the outstanding features is the Honors Night Dinner on November 9 at which the Sir Henry Wellcome Medal and Prize, the Gorgas Medal, the Stitt Award, the McLester Award, the Louis Livingston Seaman Prize, and the Founder's Medal will be presented.

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**Association's Office
Suite 718, New Medical Building
1726 Eye Street, N.W.
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ASSOCIATION NOTES

Timely items of general interest are accepted for these columns. Deadline is 3rd of month preceding month of issue.

Department of Defense

Ass't Secretary (Health & Medical)—HON. FRANK B. BERRY, M.D.
Deputy Ass't Sec'y—HON. EDW. H. CUSHING, M.D.

AFIP TO DEDICATE BUILDING

The Armed Forces Institute of Pathology will hold its dedication ceremonies for its new building at the Walter Reed Army Medical Center on May 26 and 27. President Eisenhower is expected to give the dedicatory address at 1:30 P.M. on May 26. At 8:00 P.M. Dr. Wendell M. Stanley, University of California, will deliver a lecture—*New Horizons*—at the Sternberg Auditorium.

Pathology in relation to environmental diseases is the theme of the scientific program for May 27. Dr. Arnold R. Rich, Professor of Pathology, Johns Hopkins University Medical School, and Dr. Howard T. Karsner, Research Advisor to the Surgeon General of the Navy, will preside over the scientific program which will consist of the following papers: *Ultraviolet Cancer*, Harold F. Blum, Ph.D., Princeton University. *Malnutrition*, Jean R. Oliver, M.D., State University of New York.

Acute Renal Failure, John P. Merrill, M.D., Boston, Mass. *War Wounds*, Captain Wm. M. Silliphant, MC, USN, and John H. Howard, M.D., Houston, Texas.

Physiopathology of Extreme Changes in Barometric pressure, Capt. Albert R.

Behnke, MC, USN, and Alberto Hurtado, M.D., Lima, Peru.

Others participating in the scientific program are: Col. Jos. L. Bernier, DC, USA, and Webb E. Haymaker, M.D.

EPIDEMIOLOGICAL BOARD MEETING

The Armed Forces Epidemiological Board's Commission on Enteric Infections and Environmental Hygiene met recently in New Orleans to study problems in its field of interest. The board is concerned with the study of epidemics and epidemic diseases in the Armed Forces.

The President of the Board and member of its commission on respiratory diseases is Dr. Colin M. MacLeod of the New York University College of Medicine. The Director of the Commission on Enteric Infections is Dr. Albert V. Hardy of the Florida State Board of Health; the Director of the Commission on Hygiene is Dr. Charles E. Smith, University of California, Berkeley.

EPIDEMIOLOGICAL BOARD ASSIGNMENT

Lt. Col. Raymond E. Dockery, USAF (MSC), has assumed duties with the Armed Forces Epidemiological Board as Assistant Executive Secretary. (Colonel Dockery is a graduate pharmacist.) The Board, of which Col. Adam J. Rapalski is Executive Secretary, has offices in the Army Surgeon General's Office.

MEDICAL ITEMS FOR STANDARDIZATION

The Armed Forces Medical Materiel Standardization Committee recently revised its instructions pertaining to the presentation of medical items for consideration by that committee. The only change pertains to medical items; a statement is not required that the item has been accepted by the Ameri-

can Medical Association Council. That association has discontinued its Council Approved section.

CEILING FOR FLAG AND GENERAL OFFICERS

The Senate Armed Services Committee clamped on the military services a new ceiling for flag and general officers. The Committee approved a top limit of 1266 high-ranking officers for 1955, with a promise that further revision is forthcoming. Under the new ceilings, the Navy is permitted to have 287 admirals, the Army is allowed 494 generals, the Air Force 425 and the Marine Corps 60.

Army

*Surgeon General—MAJ. GEN. GEORGE E.
ARMSTRONG
Deputy Surg. Gen—MAJ. GEN. SILAS B.
HAYS*

CIVILIAN MEDICAL CARE FOR ARMY PERSONNEL

One of the most important and necessary services furnished the American soldier is adequate and timely medical care and treatment, including hospitalization. This service is provided for Army personnel at the many military installations throughout the country. There are many locations, however, where Army or other United States federal medical treatment facilities are not available when medical service is required by Army personnel. In cases of this nature, the services of civilian physicians, clinics, and hospitals are necessary and have rendered invaluable service.

Civilian medical care (*other than elective*) at the expense of the Army is authorized for commissioned officers, warrant officers, enlisted personnel, cadets of the United States Military Academy, and prisoners when these personnel are on a duty status or when they are absent from their place of duty on other AUTHORIZED non-duty status. PAYMENT FOR CIVILIAN MEDICAL EX-

PENSES INCURRED BY ARMY PERSONNEL WHO ARE ABSENT WITHOUT LEAVE IS NOT AUTHORIZED. (Have individual present copy of his orders and his identification.)

Army personnel are authorized civilian medical care only when there are no military or other federal medical treatment facilities available, except that first aid or emergency treatment is authorized at any time, notwithstanding the proximity of military or other federal medical treatment facilities. In this connection, emergency medical care may be defined as that required to save life, limb, or prevent great suffering. Surgical operations should not be performed without prior approval of the surgeon of the nearest military installation or the appropriate military authority at an Army Area Headquarters unless indicated as an emergency procedure.

Medical care of dependents of military personnel from civilian sources, at Army expense, is not authorized.

As a general rule, military authorities will furnish the civilian medical agency with prior written approval for ordinary medical care to Army personnel, as listed above, under their jurisdiction. For emergency cases treated without prior written authorization, the commanding officer of the patient's organization and the surgeon of the Army area in which the treatment is rendered should be immediately notified by the civilian medical agency giving the individual's name, organization, military address, nature of illness or injury and statement of the practicability of transfer of the patient to an Army or other governmental hospital. The civilian agency or physician then will be advised without delay by the appropriate military authorities as to procedures to be followed.

Bills for medical care and treatment of Army personnel who have presented authorization or have received emergency treatment should be submitted to the commanding officer of the organization to which the patient belongs, or to the military authority who provided the authorization for the medical service.

The bill should show the full name, rank

and service number of the patient and his organization. The place and inclusive dates of treatment, diagnosis, and itemized charges must be entered on the statement. The lack of this information seriously impairs prompt payment by the Army. The duty status of the patient at the time of illness or injury, such as duty, leave, or pass should be included, if known. Payment will be further expedited if the following certificate is typed on the bill and signed:

"I certify that the above charges are correct and just; that payment therefor has not been received; that the services were necessary in the care and treatment of the person named above; that the services were rendered as stated; and that the charges do not exceed those customarily charged in this vicinity."

(Signature of Payee) (Business Title or Capacity)

Answers to specific questions or further information concerning this matter may be requested of military surgeons or from The Surgeon General, Department of the Army, Washington 25, D.C. Any difficulties that are experienced should be called to the attention of these Army authorities in order that this program may function smoothly toward best interests of the patients as well as the claimant.

(Doctors: Cut out and keep for future reference)

ADVISORY COUNCIL FOR RESERVE AFFAIRS

The Council on Reserve Affairs, composed of five general officers in the Army Reserve, has been enlarged by two additional Reserve officers: Brig. Gen. James B. Mason, Director of Professional Education and Accreditation, American College of Surgeons, Chicago; and Brig. Gen. Manfred U. Prescott, of San Francisco.

The five members appointed when the Council was organized in October 1954 are: Maj. Gen. I. S. Ravdin, University of Pennsylvania; Brig. Gen. Perrin H. Long, College of Medicine, State University of New York; Brig. Gen. Alexander Marble, Joslin Clinic, Boston; Brig. Gen. Harold G. Scheie, University of Pennsylvania; and Brig. Gen. Frank E. Wilson, Director, Washington Office, American Medical Association.

Maj. Gen. George E. Armstrong, the Surgeon General, stated that the advice of the Council will be sought on special Reserve matters having far reaching impact on the health professions of the nation, on those problems concerning the general activities of the Army's Medical Reserve, and on how to promote closer relationships between the military and civilian medicine so as to increase the strength of the Army Medical Service Reserve.

MSC CHIEF RETIRED

Colonel Robert L. Black, Chief of the Medical Service Corps, retired March 31 after 30 years of service which began as an enlisted man in the Medical Department. He has been in the position as chief of that corps for the past four years.

Colonel Black has accepted an appointment as Administrator of the Memorial Medical Center, Williamson, West Virginia. This is one of the centers which is being established by the United Mine Workers Welfare and Retirement Fund for beneficiaries of that fund.

CHIEF, SURGICAL RESEARCH BRANCH

Major Charles C. Pixley, MC, has assumed the position of Chief of the Surgical Research Branch, Research and Development Division, Surgeon General's Office.

Major Pixley is a native of Oregon. He received his medical degree from the University of Oregon Medical School in 1947 and his MS in Surgery from Baylor University in 1953. He is a diplomate in the American Board of Surgery.

CHAIRMAN, DENTAL RESEARCH ADVISORY COMMITTEE

Colonel Joseph L. Bernier, DC, has been re-appointed to the chairmanship of the Dental Research Advisory Committee, Research and Development Division, Office of the Surgeon General.

Other members of the committee are: Lt. Col. William V. Hill, Major Robert W. Hobson, Dr. William R. Mann, Dr. James

R. Blayney, all of whom are newly appointed members; the continuing members being, Colonel Thomas A. McFall, Lt. Col. George W. Burnett, Dr. Joseph L. T. Appleton, Dr. Wallace D. Armstrong, and Dr. Thomas J. Hill.

CERTIFICATE OF APPRECIATION

Mrs. Mary C. Rockefeller was presented with a certificate of appreciation at the Annual Chief Nurses Conference in the Office of the Surgeon General. Colonel Ruby F. Bryant made the presentation and mentioned her patriotic civilian service to the Army Nurse Corps as chairman of the Professional Services Sub-Committee of the Defense Advisory Committee on Women in the Services. The Secretary of the Army, Honorable Robert T. Stevens, and the Surgeon General, Maj. Gen. George E. Armstrong, were present at the presentation of the award.

RECEIVES FRENCH DECORATION

Lt. Colonel Frank J. Vita, MC, received the Medal of Honor of the Military Health Services of France at a ceremony held recently at the Val-de-Grace Military Hospital and Medical Service School in Paris. The Directeur of the Health Services of the French Armed Forces, Major General George Hugonot, made the presentation. He



LT. COL. FRANK J. VITA receives congratulations from Maj. Gen. Hugonot.

said, "This medal is in recognition of the outstanding manner in which Colonel Vita had carried out his mission, the first such intimate liaison between our two Medical Services."

Among those who witnessed the ceremony were Major General Thomas deShazo and his staff, Brigadier General Jacques Pesme, Commanding General of the School, members of the school faculty and hospital staff and representatives of the student body.

LOGEX-55

One of the largest logistical maneuvers in peacetime Army history, LOGEX-55, was held at Fort Lee, Va., May 2-7. More than 5000 student officers, observers, umpires, and enlisted personnel took part. The maneuver was used to test new logistical concepts developed by the First Logistical Command, Fort Bragg, N.C., and was at the direction of the Continental Army Command, Fort Monroe, Va. These concepts propose the relief of combat commanders from many logistical or support responsibilities they have held in the past and stress new methods of dispersion and flexibility to counter the mass destruction weapons which may be used in a future enemy attack.

Planning of the maneuver was done at the Medical Field Service School under the direction of Brigadier General James P. Cooney, Commandant. He was designated Maneuver Director. Colonel James L. Snyder, MC, of the School was Deputy and Colonel Charles H. Schutt, MC, of the School was Maneuver Chief of Staff.

SKINNER AWARD

First Lieutenant Marcel E. Conrad, Jr., of Bethesda, Maryland, was the recipient of the Skinner Award at a recent graduation ceremony at the Medical Field Service School, of which Brig. General James P. Cooney is Commandant.

The Skinner Award is made annually to the Medical Corps officer making the highest scholastic record in the School. The award is named after its founder, Dr. John O. Skin-

ner, who provided a self-perpetuating fund for the annual award.

Lieutenant Conrad is a graduate of the Georgetown University Medical School, Washington, D.C. (1953). He will receive further training at Walter Reed Army Medical Center.

ASS'T. INSPECTOR GENERAL—BAMC

Lt. Colonel Thomas Pugh has been appointed as Assistant Inspector General of the Brooke Army Medical Center. He was formerly Executive Officer of the 30th Medical Group in Korea.

RECEIVES COMMENDATION RIBBON

First Lieutenant Kenneth K. Wheatley, Medical Field Service School was recently presented with the Commendation Ribbon with Medal Pendant for outstanding quality of leadership and personal enthusiasm in the performance of duties while a member of the 57th Medical Battalion in Frankfurt, Germany, from March 1952 through June 1954.

Lt. Wheatley had previously been awarded the Bronze Star Medal with Oak Leaf Cluster and the Purple Heart.

ARMY FIELD HOSPITAL ACTIVATED

The 47th Army Field Hospital was activated at the Brooke Army Medical Center on March 15. The unit last saw active duty in 1945 in the European Theater.

The commander of the new unit is Captain Worsham B. Roberson; the commander of the 67th Medical Group of which the hospital is a unit, is Lt. Colonel Burchard M. Wright.

TECHNICAL BULLETIN

A new technical bulletin, TB Med 97, *Rheumatic Fever*, has been released. The technical bulletins, constantly being revised to include the latest developments on a subject are a source of valuable information, and should form part of the medical library of every military medical installation.

Navy

Surgeon General—REAR ADM. BARTHOLEMEW W. HOGAN

Deputy Sur. Gen.—REAR ADM. BRUCE E. BRADLEY

STUDY GUAM DISEASE

Dr. Edward H. Lambert and Dr. Donald W. Mulder, medical scientists from the Mayo Clinic, Rochester, Minnesota, recently spent several weeks on the island of Guam studying a slightly known but progressive and usually fatal neurological disorder of unknown origin that has been found more prevalent among Guamanians than elsewhere in the Pacific.

The disease, commonly called "lytico" on Guam, bears the medical name "amyotrophic lateral sclerosis." It is presumed to be due to a gene deterioration caused by the continued intermarriage of Chamorro people over a period of 800 to 1000 years.

The two scientists, who are working in collaboration with the Navy's Bureau of Medicine and Surgery, covered Ponape, Truk, Rota, Tinian, Saipan, Yap, Ulithi and Guam in their evaluation of "lytico."

Dr. Mulder, a consultant in neurology at Mayo Clinic, began this project during the war when attached to the Navy. His familiarity with the disease prompted the Navy to obtain his services from Mayo Clinic. With Dr. Lambert, who is consultant and associate professor of physiology at the Mayo Clinic, Dr. Mulder was sent to Guam to complete his war-time study and project a cure, if possible. Assisting them with the project was Lorenzo Iriarte, a graduate of the Naval Medical school for native practitioners.

NAMED DEAN OF NEW DENTAL SCHOOL

Captain Merritte M. Maxwell, DC, has recently been named dean of the newly founded College of Dentistry at Seton Hall University, Jersey City, New Jersey. The new school will be located in a 16-story

building leased from the Jersey City Medical Center, which will be converted to house both the dental and the new medical colleges.

Captain Maxwell entered the Navy as an enlisted man in World War I, and was commissioned an Ensign in the line of the Navy in May 1919. He graduated from the University of California College of Dentistry in 1925 and was appointed in the Dental Corps of the Navy in 1928. He has had a long, distinguished career in the Navy Dental Corps.

ADDITION TO DENTAL DEPARTMENT

A \$45,000 addition to the Dental Department of the Boston Naval Shipyard was officially opened recently by Rear Admiral Ralph W. Taylor, DC, Inspector of Naval Dental Activities, Atlantic Coast.

HEART BECOMES RADIO TRANSMITTER

Captain Norman L. Barr, MC, National Naval Medical Center, has developed a pocket-size radio transmitter that will broadcast heart and lung activity of the patient to whom the apparatus is attached.

The radio is about the size of a package of King-size cigarettes and weighs about one pound. The range is limited to the hospital ground. The doctor, through a receiving station on his desk, can study the activity of the heart and lungs under any phase of the patient's daily life.

SPEAKS AT AERONAUTICAL UNIVERSITY

Captain J. C. Early, MC, Commanding Officer of the Naval School of Aviation Medicine spoke recently at the Annual Student Symposium of the Aeronautical University, Chicago, Illinois.

He was well qualified to speak on the subject, "Testing Techniques of Airplanes and Men," since he is both a veteran naval flight surgeon and a naval aviator.

ORIENTATION CRUISE

Why not let the other half of the personnel on the post know something about the workings of the station? Captain J. C. Early, Com-

manding Officer of the Naval School of Aviation Medicine, Pensacola, Florida, thought they should know. So a conducted tour, known as operation "Home Folks," through the various sections of the school was staged. The ladies and children were shown what the men folks were really doing. The clinics and laboratories were visited. The tour proved to be very interesting and the report is that it was greatly appreciated.

NEW ELECTROCARDIOGRAPHIC ELECTRODE

A new type of electrocardiographic electrode has been developed at the U. S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Florida. The new electrode consists of solidified plaster of paris containing table salt and obviates the use of electrode pastes. The new technique saves considerable time and permits recording of the heart in rapid sequence from innumerable points on the chest immediately adjacent to each other and from the standard positions on the limbs. A few drops of water placed on the new electrodes initially is all the preparation necessary to obtain as many individual recordings as desired.

Captain Ashton Graybiel, MC, USN, and Lieutenant Louis R. Krasno, MC, USN, who developed the new plaster electrocardiographic electrodes, report that the recordings obtained with the new type of electrode are equally as good as those obtained with electrode pastes. They have found the new technique of special value where many patients are to be tested, and when extensive electrocardiographic exploration of the chest is desired.

RETIRED

The following officers were recently retired from the Navy Medical Service:

Captain Paul Peterson, MC, 6490 Cleo St., San Diego, Calif.; Captain Rae D. Pitton, DC, 2815 W. Smith St., Seattle 99, Wash.; CDR Ashton Emerson, MC; CDR James E. Eppley, MC; LCDR Warren F. Postel, MSC; Lt. Evelyn R. Allen, NC; Lt. Mary K. Friebe, NC.

Air Force

Surgeon General—MAJ. GEN. DAN C. OGLE
Deputy Surg. Gen.—MAJ. GEN. W. H. POWELL, JR.

VETERINARY MEDICINE CONSULTANT

The Surgeon General, Major General Dan C. Ogle, recently announced the appointment of Dr. Floyd Cross, Dean of the School of Veterinary Medicine at Colorado A. and M. College, Fort Collins, Colorado, as National Consultant in Veterinary Medicine. He is president-elect of the American Veterinary Medical Association.

In the early part of the Korean conflict, Dr. Cross, at the request of the Air Force, established and supervised a school for Air Force veterinary technicians on the campus at Colorado A. and M. There were over 200 well trained technicians graduated.

Dr. Cross will function as an advisor to the Surgeon General on matters pertaining to the Air Force veterinary public health program and military veterinary medicine in general.

DENTAL EXHIBIT

Featured at the recent 90th Midwinter Meeting of the Chicago Dental Society was an exhibit, "U. S. Air Force Dental Officer Careers." The exhibit was monitored by Col. Robt. D. Johnson, Lt. Col. Jos. J. Fields, Maj. Roy W. Osterkamp, and Maj. Wm. C. Schulte.

A table clinic presentation called "Impressions for Full Dentures" was given by Lt. Col. Allen A. Brewer of March Air Force Base.

The Air Force was also represented by Maj. Gen. Marvin E. Kennebeck, Col. Chas. W. Craig, Lt. Col. Kenneth R. Elwell, and Dr. Kermit F. Knudtzon, Consultant in Dentistry to the Surgeon General.

COMMENDATION RIBBON AWARDED

Lt. Colonel Alvin F. Meyer, Jr., Chief, Preventive Medicine Branch, Headquarters Strategic Air Command, was recently pre-

sented the Air Force Commendation Ribbon by General Curtis LeMay, SAC Commander.

The citation read in part, "As a result of his outstanding ability, foresight and initiative a sound and effective medical and occupational health program for military and civilian personnel of Air Materiel Command has been established."

Public Health Service

Surgeon General—LEONARD A. SCHEELE, M.D.
Deputy Surg. Gen.—W. PALMER DEERING, M.D.

ASS'T. CHIEF, DIVISION OF HOSPITALS

Dr. Waldemar J. A. Wickman has been appointed Assistant Chief, Division of Hospitals, Public Health Service. He was formerly Chief, Outpatient Branch, Division of Hospitals.

Dr. Wickman is a native of Michigan. He received his medical degree from the University of Michigan in 1930 and joined the Public Health Service as a medical intern at its hospital in Norfolk, Virginia. During his service he was assigned to the State Department for four years, serving in Canada, Italy, and Poland. While in Warsaw, Poland, the Germans invaded that country. Dr. Wickman left during a four-hour armistice three weeks after the invasion started.

In 1949 he earned his Master of Public Health degree at Johns Hopkins University, majoring in public health and hospital administration.

CHIEF, HEALTH EMERGENCY PLANNING

Dr. John B. Hozier has been named chief of the Office of Health Emergency Planning of the Public Health Service. He succeeds Gordon E. McCallum who has been named chief of the Service's Water Pollution Control Program.

The Office of Health Emergency Planning is the Surgeon General's principal staff office in planning and coordinating emergency programs and activities of the Public Health

Service. There are certain responsibilities under the civilian defense program which are delegated to the office by the Surgeon General.

HOUSE REDUCTION OF HEW 1956 BUDGET

In the March issue we published the budget request of the administration to run the Department of HEW in the next fiscal year. Action of the House on March 21 reduced the amount originally asked for to a total of \$1,907 million dollars. The reduction is about \$42 million dollars. Most of the cut (in millions) comes from funds planned for the Hill-Burton Hospital and Clinic programs (29), the Office of Vocational Rehabilitation (7.2), Indian health activities (4.2), and the Food & Drug Administration (1.1). Nothing was allowed for the Civil Defense activities of the Public Health Service since the House Appropriation Committee proposed a unified civil defense budget.

DONABLE PROPERTY BILL AND HEW

Sponsored by House Majority Leader John McCormack, a bill was approved by unanimous vote of the House, re-establishing the authority of the Department of Health, Education and Welfare to allocate surplus government property for health and educational purposes. The bill would set aside a Defense Department directive that prevented the free distribution of surplus items to public agencies. If concurred by the Senate, the McCormack Bill will greatly promote the economic status and the cultural program of smaller public institutions in the United States.

TRAINING COURSES

The first of a series of courses for physicians and other professional health personnel who would be called to duty in the event of enemy action or other national emergency was held in March in Washington by the Public Health Service. Training was in the field of chemical, biological, and radiological warfare.

Each trainee, a member of the Commissioned Reserve Corps of the Public Health

Service, attended the course as part of the Service's recently announced program to expand its commissioned reserve by 5,000 new officers by July 1, 1956.

The second course will be held May 15 and other courses will follow.

Veterans Administration

Chief Medical Director—WILLIAM S. MIDDLETON, M.D.

Deputy Chief Med. Dir.—R. A. WOLFORD, M.D.

ASSIGNMENTS

Dr. Michael L. Matte has been transferred from his assignment as manager of the Denver Veterans Administration Hospital to a similar assignment at the VA research hospital in Chicago.

Dr. Harold M. Engle, who has been manager of the VA hospital at Salt Lake City, Utah, will replace Dr. Matte at Denver.

Dr. William W. Fellows has been transferred to Washington, D.C., where he became Assistant Chief Medical Director for Planning in the VA's Department of Medicine and Surgery.

Dr. Thomas O. Lake, chief of professional services at the VA hospital in Oakland, California, was promoted to manager of the Salt Lake City hospital.

Dr. Amerigo P. Dell Cort, chief of professional services at the VA hospital in Lexington, Ky., has been promoted to manager of that hospital. He succeeds Dr. Frederick M. Cook who retired in February.

Dr. Howard P. Morgan, chief of professional services at the VA hospital in Roanoke, Va., has been promoted to manager of the VA hospital at Fort Lyon, Colorado. He succeeds Dr. Mansell B. Holmes who resigned March 31.

QUADRUPLE AMPUTEE GOES TO WORK

Robert L. Smith, first quadruple amputee of the Korean conflict, has gone to work as a tabulating machine operator for the Veterans Administration in the Washington office. He is 24 years old and a native of Middle-

burg, Pennsylvania. With the will to learn and earn he spent 88 hours with the International Business Machine Company in Washington, D.C., after spending months as a patient in the Walter Reed Army Hospital. He was wounded in North Korea in November 1950 and incurred frostbite of the arms and legs which resulted in amputation.

MAGNETIC EYE

An artificial eye which is operated by magnets and moves in its socket as the living eye which it matches has been developed at the Boston Veterans Administration Hospital by Doctors Everett H. Tomb and Donald F. Gearhart.

Research has been going on for six years and has resulted in a magnetized implant, the magnet of which is placed within clear, non-irritating plastic. The muscles of the eye are attached to this implant. A permanent magnet is set into the artificial eye during its fabrication to match the magnet of the embedded implant. These magnets are so aligned that the artificial eye cannot slip out of correct normal position. The artificial eye, being held close magnetically to the surgically buried implant, follows the implant's motion.

PROBLEMS OF THE AGING VETERAN

About 2.5 percent of the 21 million veterans are 65 years or more of age. Yet, 10 percent of the daily hospital bed patient load is taken up with this group of veterans, and when we look into the figure for the "homes," or domiciliaries, this figure advances to 31 percent.

A real problem exists since with the increasing number of veterans there is a larger and larger percentage approaching the old age group.

The problem of the care of the aged is not confined to the Veterans Administration. With the increase in the life span of man, more and more persons are entering the group of those over 65 years of age. To be sure not all of these require a hospital bed but, as the percentage of aged persons increases, it is obvious that the total bed

requirements and total care increases.

The Veterans Administration is attacking its problem on three broad fronts: (1) establishing specific programs and specialized facilities for the aged; (2) developing trained personnel for the program; (3) conducting research in the general area of care for the aged.

A new program is being tested to determine whether the chronically ill may be provided better medical treatment by caring for them as a group in *special intermediate beds* where they may receive a type of medical service between that required by the more acutely ill and that provided by the domiciliary home.

The vocational counseling service has been developed to help the aged patients return to their communities as self-supporting or partially self-supporting citizens again. This service functions in a two-fold manner: (1) to determine what skills and abilities these patients still may have that are useful to industry and society, and (2) to assist in placing them in jobs on which they may use these skills and abilities.

The many problems to be solved in the care of the aged will require the attention of a number of groups of investigators for years to come. In the membership of the groups it should not be lost sight of that among the aged there are those who have ability, interest, physical capacity, and time to assist in the solution of those problems.

Miscellaneous

PROGRAM MILITARY MEDICINE SECTION, AMA

Tuesday, June 7, 1955

Chairman's Address "The Civilian Doctor and Our Future Security"—Major General Isidor S. Ravidin, MC, USAF.

"Uremia-like Symptoms, Not Due to Uremia, in Battle Casualties"—Major W. H. Meroney, MC, USA

Discussants: A. C. Corcoran, M.D., and Lt. Paul D. Doolan, MC, USN.

"Acute Coronary Insufficiency. Application to Military Medicine"—Arthur M. Master, M.D.

Discussants: Charles K. Friedberg, M.D. and Col. Archie Hoffman, USAF (MC).

Co-Authors: Harry L. Jaffe, M.D., and Leonard E. Fields, M.D.

"Handicaps, Motivation, and the Performance of Duty"—Colonel Lucio E. Gatto, USAF (MC).

Discussants: Arthur S. Abramson, M.D., and Col. Richard R. Cameron, MC, USA.

"Acute Infectious Hepatitis in the Armed Forces: The Advantages of Ad Lib Bed Rest and Early Reconditioning"—Captain Thomas C. Chalmers, MC, USAR.

Discussants: W. Paul Havens, Jr., M.D., and Capt. Lester J. Pope, MC, USN.

Co-Authors: Wm. E. Reynolds, M.D.; Richard D. Eckhardt, Lt. Cdr., USNR; Joaquin G. Cigeroa, M.D.; Norman Deane, M.D.; Robert W. Reifenstein, M.D.; Clifford W. Smith, M.D.; Charles S. Davidson, M.D.

"Peptic Ulcer: A Major Problem in Military Medicine"—John H. Willard, M.D.

Discussants: Joseph M. Hayman, Jr., M.D. and Col. Benjamin H. Sullivan.

Wednesday, June 8, 1955

"Crash and Live: Need Cars Kill More Soldiers Than Guns?"—Colonel Don S. Wenger, USAF (MC).

Discussants: R. Arnold Griswold, M.D., and Col. George Peer, MC, USA.

"Response of Human Beings Accidentally Exposed to Significant Fallout Radiation."—Cdr. Robert A. Conard, Jr., MC, USN.

Discussants: Lee E. Farr, M.D., and Major Carl Hanson, USAF, (MC).

Co-Authors: Eugene P. Cronkite, M.D., Victor P. Bond, M.D., Lt. N. R. Shulman, MC, USN, and Richard S. Farr, M.D.

"The Care and Evacuation of Vietnamese Refugees"—Cdr. J. M. Amberson, MC, USN.

Discussant: Major General Dan C. Ogle, USAF (MC) The Surgeon General, USAF.

"Breaking the Sound Barrier and Its Effect on the Public"—Colonel John M. Talbot, USAF (MC).

Discussants: Cdr. Sidney I. Brody, MC, USN.

"Report of the Office of the Assistant Secretary of Defense"—Hon. Frank B. Berry, M.D., Assistant Secretary of Defense (Health and Medical).

Thursday, June 9, 1955

Combined Program with Section on Surgery, General and Abdominal

"Concepts of the Provision and Use of Whole Blood in Military and Civilian Defense Emergency"—Lt. Colonel William H. Crosby, Jr., MC, USA.

Discussants: John G. Gibson, 2d, M.D., and Cdr. Mary Sproul, MC, USN.

Co-Author: Lt. Colonel Joseph H. Akeroyd, MSC, USAR.

"Management of Injuries to the Thorax"—Brian Blades, M.D.

"Psychological Reactions in Mass Casualties"—Captain E. L. Caveny, MC, USN.

Discussants: Calvin Drayer, M.D., and Colonel Albert J. Glass, MC, USA.

"The Primary Care of Injuries About the Face"—Truman Blocker, M.D.

"Principles of Management of Open Fractures"—Oscar Hampton, Jr., M.D.

"Modern Concepts in the Treatment of Burns"—Lt. Colonel Curtis P. Artz, MC, USA.

Discussants: Henry P. Royster, M.D., and Major Oakley Park, USAF (MC).

Point Credits Given to Reserve Officers

NEW MEDICAL SCHOOLS

The Albert Einstein College of Medicine is scheduled to open in September of this year in the northeast Bronx.

In the fall of 1956 New Jersey's first medical school, the Seton Hall College of Medicine and Dentistry, will be opened at South Orange, N.J.

The University of Florida will open the College of Medicine and College of Nursing in the fall of 1956 at Gainesville.

AEROSOLSCOPE

A device, recently developed by Nelson E. Alexander, Frederick, Md., will measure air particles: dust, bacteria, and radioactive particles.

He has named it the *aerosoloscope*. Its uses will be many, not only as a detector in case of germ warfare, but also a valuable instrument in the ever increasing problem of air pollution in industrial areas.

ASPIRIN POISONING

According to the United States statistics the number of cases of poisoning by aspirin and other salicylates is increasing. More than 50% of the victims are children under five years of age, as revealed by Dr. Albert H. Holland, Food and Drug Administration Medical Director.

To prevent accidental ingestion of salicylate containing preparations, new regulations have been recommended by a special advisory panel to the Food and Drug Administration. The new rules include the in-

scription of a warning on all bottles and packages of salicylates, specifications of dosage, etc.

Let us not be too alarmed, therefore, when on the next box of aspirin we buy we read the statement in bold-face type: "Warning. Keep out of the reach of children."

SHORTAGE OF HEALTH PERSONNEL

A recent report of the Health Resources Advisory Committee has stated that there is going to be a shortage of health personnel for many years to come. Fewer physicians, fewer dentists, but no shortage in nurses is the forecast for 1960.

TESTS OF CHEMICAL POISONS

Starting in April, the Army Chemical Center, Edgewood, Md., began a series of tests to evaluate the protective action of its newly developed equipment and techniques against chemical warfare agents. The tests are carried out under rigid laboratory control by physicians and scientists, and their results are expected to help to determine the degree of efficiency with which the soldier can maneuver under varying weather conditions. The physicians and scientists have already subjected themselves to the effect of these warfare poisons.

CIVIL DEFENSE INFORMATION

The Federal Civil Defense Administration has announced the release of two new motion picture films which are available on a purchase or free loan basis to organizations and member clubs:

Time of Disaster, a 10 minute, black and white film dealing with civil defense in natural disasters. Loan prints may be obtained from State and city Civil Defense Offices. For purchases order from Robert Enders, Inc., 1001 Connecticut Avenue, Washington, D.C. Price: \$19.75 per print.

Frontlines of Freedom, a 13 minute film explaining the nature of the Communist threat to the free world and particularly the North American Continent. It depicts the role of both Military and Civil Defense in the event of enemy attack. Loan prints may be obtained from State and city Civil De-

fense Offices. Purchase from Byron, Inc., 1226 Wisconsin Avenue, N.W., Washington, D.C. Price: \$14.90. For other films available see FCDA Public Affairs Bulletin #159.

A pamphlet, *Facts About the H Bomb*, can be obtained from the Supt. of Documents, Government Printing Office, Washington 25, D.C. Price: \$2.75 for 100 copies.

Government Publications

Hospitalman, Navy Training	\$1.00
No. D 208.11:H 79/954 .....	.....
Handbook for the Leg Amputee	15
No. VA 1.19:10-37 .....	.....
Standard Drug Catalogs	20
No. C 18.277:250-53 .....	.....
Practical Nursing Curriculum	65
No. FS 5.30:11 .....	.....
Emergency Mass Feeding	55
No. FCD 1.2:F 32 .....	.....
Health Manpower Source Book	30
Med. Rec. Lib. No. FS 2.2:M 31/6 .....	.....
Staffing the General Hospital (25-100 beds) No. FS 2.6:H 79/2 .....	.....
Prenatal Care	25
No. FS 3.209:4 .....	.....
Infant Care	15
No. FS 3.209:8 .....	.....
Water Pollution in U.S.	20
No. FS 2.64:1 .....	.....
Environment and Health	45
No. FS 2.2:En 8 .....	.....

Above may be obtained from the Supt. of Documents, Govt. Printing Office, Washington 25, D.C.

WORLD HEALTH ORGANIZATION PUBLICATIONS

Poliomyelitis (cloth bound)	\$8.00
Tuberculosis, Vol. 12, No. 1-2 .....	.....
Influenza (French & English)	4.00
Nutrition in Latin America & SE Asia, Vol. 8,	1.50
No. 11 (Nov. 54) .....	.....
Health Education of the Public Tech Report No. 89	25

Available from: Columbia University Press, 2960 Broadway, New York 27, N.Y.

BOOK ON SAFETY EDUCATION

John C. Larson and four other researchers have issued a report showing that human behavior is responsible for 70 to 80 percent of industrial accidents. The book, *The Human Element and Industrial Accident Prevention*, analyzes the cause of accidents among workers.

Further information about the report may be obtained from the Center for Safety Education, Division of General Education, New York University, 6 Washington Square, New York 3, New York.

TECHNICAL EDITORS AND WRITERS WANTED

The Civil Service Commission needs technical editors and writers for Federal agencies in Washington, D.C., and vicinity. The annual salaries range from \$3,410 to \$10,800.

Applications should be made to the Executive Secretary, Board of U. S. Civil Service Examiners for Scientific and Technical Personnel, Potomac River Naval Command, Naval Research Laboratory, Washington 25, D.C.

VACANCIES FOR PHYSICIANS

The Military District of Washington has vacancies for physicians in its Civilian Employee Health Service. Salaries range from \$7040 to \$9360 per annum with the annual leave and sick leave allotted time for Civil Service Employees.

Further information may be obtained from the Civilian Personnel Office, Military District of Washington, Washington 25, D.C.

AWARDS IN GASTROENTEROLOGY

The American College of Gastroenterology, in cooperation with the Ames Company of Elkhart, Indiana, has established three classes of awards for papers in Gastroenterology: (1) Fellows or Residents of Gastroenterology, first prize—\$250; second prize—\$50; (2) First or Second Year Internes, first prize—\$250; second prize—\$50. All prizes also carry a subscription for one year to *The American Journal of Gastroenterology*.

For the best paper published in that journal during a twelve months' period for which no prize was awarded \$100 will be given.

Further details can be obtained from the American College of Gastroenterology, 33 West 60th St., New York 23, N.Y.

ARTIFICIAL INTERNAL ORGANS SOCIETY

A group of approximately 30 investigators and clinicians who are prominent in the de-

velopment of artificial kidneys, artificial heart-lung machines, etc., have organized the American Society for Artificial Internal Organs. Address: Dr. Peter F. Salisbury, Institute for Medical Research, Cedars of Lebanon Hospital, 4751 Fountain, Los Angeles 29, Calif.

CHEST PHYSICIANS MEETING

The American College of Chest Physicians will meet at the Ambassador Hotel, Atlantic City, New Jersey, June 1 through 5. Fellowship examinations will be held on June 2, and on June 4 more than 100 physicians will receive their Fellowship certificates.

Interested physicians are invited to attend the meeting; there is no registration fee. Copies of the program may be obtained by writing to the Executive Office, 112 East Chestnut St., Chicago 11, Ill.

New York Chapter



CAPTAIN H. EASTON McMAHON, MC, USNR
Secretary

O B I T U A R I E S

Cmdr. George R. W. French, U.S. Navy, Retired

George Reuben Williamson French, USN, retired, died in the Naval Hospital, Oakland, California, February 26.

Commander French was a native of Massachusetts. He received his degree in medicine from the University of Pennsylvania in 1908; was appointed an Acting Assistant Surgeon in the Navy in 1909 and promoted to commander in 1925. He was retired in 1937, but was recalled to active duty in 1940. In 1945 he was released from active duty. One of his assignments in the service was at Edgewood Arsenal in connection with the development of gas warfare for Naval use.

He is survived by his wife, Mrs. Barbara E. French, 19 Bridge Road, Berkeley, California.

Capt. Dudley N. Carpenter, U.S. Navy, Ret.

Dudley Newcomb Carpenter, Captain, U. S. Navy, retired, died in the Naval Hospital, Bremerton, Washington, March 26. He was 80 years old.

Captain Carpenter was a native of Maine. He graduated from Harvard University Medical School in 1896, and was appointed in the Navy as Assistant Surgeon with the relative rank of Ensign in October 1896. He was promoted to Captain in 1918, and retired with that rank in 1933. In 1943 he was recalled to active duty, and in 1945 released again to inactive status. He was commended for his service during military operations in Manila, 1899, and received the Navy Cross during World War I.

He is survived by his daughter, Mrs. Phoebe C. Ayrault, 23 Forest Glen Lane, Tacoma, Washington.

BOOK REVIEWS

NEURO-OPTHALMOLOGY. 2d Edition. By Donald J. Lyle, B.S., M.D., F.A.C.S. Professor and Director, Dept. of Ophthalmology, College of Medicine, University of Cincinnati. 591 pages, illustrated. Charles C Thomas, Springfield, Ill. 1954. Price \$17.50.

This book is a complete revision of Dr. Lyle's first edition of Neuro-Ophthalmology. Of the 335 figures, 143 are new, and of the twenty-two charts, fifteen are new; in fact over half the book is new. The basic presentation is supplemented with a histopathologic discussion wherever necessary.

The new charts are designed to enable the reader to see much important data at a glance. This makes the book extremely valuable to the ophthalmologist as a reference work, and assists him in making a diagnosis. The writer demonstrates that he has a good understanding of the problems confronting the student and the physician when searching for data to assist in making a diagnosis of a neuro-ophthalmological condition. This book should be in the library of every ophthalmologist, neurologist, and neuro-surgeon.

Many plates in the book are arranged in three parts. The top part shows the x-ray photograph, the second part the visual field findings, and the third part, the fundus photograph. Every chapter is accompanied by a bibliography.

I feel that every known neurological condition having ophthalmological findings is mentioned. Every chapter is replete with photographs of patients.

The modern viewpoint of developmental neuro-ophthalmological conditions is a feature of this new edition. The section on syndromes includes eye symptomatology, and is a welcome aspect of this fine text. The relationship of the eye to the brain, and the effect of diseases of the brain to the eye is explained. It will be noted that scarcely an area of the brain exists that does not have some relationship to the eye. The personality of the author as a physician, surgeon, lecturer and teacher is reflected in this book.

COL. ROLAND I. PRITIKIN, MC, USAR.

FACTORS AFFECTING THE COSTS OF HOSPITAL CARE. By the Commission on Financing Hospital Care, edited by John H. Hayes. 300 pages. The Blakiston Company, Inc., New York, 1954. Price \$4.00.

This book contains the findings and recommendations of a distinguished group of physicians, educators, and hospital administrators who conducted a national study on the costs of providing adequate hospital services. The Commission was concerned, first, as to how much increasing costs are due to expanded services and how much to the higher costs of labor and materials; second, by what means may costs of care to the public be held to a minimum without impairing quality of service.

The Commission found that hospital operating expenditures for all non-federal hospitals increased from \$439 million in 1935 to \$2,718 million in 1952, a rise of 520 percent. Payroll accounted for the largest share of the increase. In 1935 payroll absorbed only 44 percent of total expenditures compared to 57 percent in 1952. Inflation, population growth, and a high rate of admissions were the three major forces causing an increase. If the rise, however, is adjusted to inflation, then the expenditure per admission rose only 20 percent.

Factors which exerted an upward pressure included: (1) increases in payroll from conversion to full cash salaries, increase in number of employees, shorter work week, and fewer unpaid workers; and (2) scientific and educational advances reflected in a growth of professional and technical services.

Factors which exerted a downward pressure included: (1) decrease in length of patient stay by 30 percent; (2) increase in utilization of facilities; and (3) improvements in hospital management.

Analysis of operating costs of 1400 short term non-profit general hospitals revealed a wide variation in expenditures per patient day in 1952. While the average cost was \$20.00 per day, in eight percent of the hospitals it was less than \$12.00 and in five percent it was \$28.00 or more. The most im-

portant factor affecting costs per patient day appears to be the scope of the hospital's service program, as determined by the number of special services offered. Hospitals which had a relatively high expense per patient day and had a similar number of special services were characterized by a shorter average length of patient stay, higher payroll expense per employee, a higher ratio of payroll to total expense, and a higher proportion of professional service expense.

The Commission believes that hospitals can reduce their operating costs by achieving better utilization of facilities and personnel. Specific programs suggested include (1) development of service for ambulatory patients by expanding outpatient and clinic services, initiating periodic physical examinations, encouraging home care, and developing prepayment plans for outpatient care; (2) promoting better utilization of inpatient services by the medical staff through pre-admission work-up, shortening of patient stay, avoiding unnecessary diagnostic procedures, and discontinuing expensive drugs when not needed; (3) stabilizing the workload by increasing the interchangeability of beds, scheduling elective admissions, and adjusting the number of operating beds as close as possible to the average census; (4) improving utilization of personnel through fresh approaches to recruitment, training, supervision, work assignment, promotion of job satisfaction; (5) effective budgeting and work measurement of inpatient and outpatient services; (6) effective rate making through promotion of prepayment plans; (7) better definition of the roles of trustees, medical staffs, and administrators, and (8) joint action in purchasing, surveying of community needs, and integrating services among community hospitals.

As an added bonus, this very valuable book includes the recommendations of the North Carolina Hospital Study Committee on Financing of Hospital Care. This study enhances the usefulness of the book to all those concerned with operation of hospitals by indicating ways and means for (1) improving the standards and efficiency of hospital operation; (2) extending prepayment plans for hospital care; and (3) for financing care for low income "medically needy" and non-wage groups.

Lt. COL. MILTON C. DEVOLITES,
M.S.C., U.S.A.

CLINICAL ORTHOPAEDICS, NUMBER 4. By Anthony F. De Palma, M.D., Editor in Chief. 240 pages, illustrated. J. B. Lippincott Co., Philadelphia, London, and Montreal, 1954. Price: Single issue, \$7.50; sustaining basis, \$5.00.

This is the fourth volume of a series of books produced under the guidance of the Association of Bone and Joint Surgeons. It is published in cloth-bound form with a two-column format and good quality black and white illustrations.

These volumes are published twice a year and designed for the publication of original articles offering significant contributions to the advancement of surgical knowledge. Each volume has two sections, the first in symposium form relative to a particular subject in orthopaedics; the second, a group of miscellaneous articles of interest to orthopaedists as well as to all physicians in the allied specialties.

The first section of this volume is devoted to joint fractures and dislocations, consisting of seven articles discussing Nicolas Andry, founder of the specialty of orthopaedics, fractures of the tibial plateau and patella, dislocations of the carpal lunate and hip, and injuries of the hip. In the second section are fifteen articles about miscellaneous subjects, including fundamentals of design as applied to orthopedic surgery, antibiotics and chemotherapy, use of hydrocortisone in the treatment of painful shoulders, heel modifications as aids in rotation control, preservation of foot balancing and synchronizing the shoe with the foot, coracobrachialis brevis syndrome, osteoid osteoma as a cause of pain in the hip, thyroid function in Legg-Calvé-Perthes disease, sciatica, synovitis of the hip, lower extremity amputations in children, osteoperiosteal flap for repair of recurrent direct inguinal hernia, sciatic and femoral nerve blocks, scapulectomy, and treatment of plantar keratosis.

The articles are interesting but with few exceptions do not present information not readily obtainable in most new textbooks. The articles present an incomplete review of the subject. The illustrations are clear but at times distract the reader because of their position. Most articles are accompanied by a list of references without uniformity of notation within the text to these references. An adequate index is included.

This volume should be useful and provide additional reading for those interested in orthopaedic conditions.

COL. JOSEPH W. BATCH, M.C., U.S.A.

SPINAL EPIDURAL ANALGESIA. By P. R. Bromage, M.B., B.S., F.F.A.R.C.S., D.A. Consultant Anesthetist, Chichester Hos-

pital Group, England, 118 pages, 41 illustrations, 8 tables. The Williams and Wilkins Co., Baltimore, 1954. Price \$3.75.

This discussion of epidural analgesia is based on a review of the literature and the author's records of one thousand personal administrations.

There are chapters on anatomy, physiology, epidural pressures, identification of the epidural space, drugs, equipment, dosage, the blood pressure, continuous epidural analgesia, indications and contraindications, and an appendix discussion of three accidents.

The text is well written, brief, and adequately indexed according to subject and authors, and is well supplemented with diagrams and pictures illustrating technical and anatomic details.

The method of analgesia is recommended for major surgery below the diaphragm and is introduced in the lumbar area. The author believes high thoracic puncture is dangerous and does not recommend that approach. The continuance epidural technic is valuable as an alternative to repeated paravertebral blocks. Caudal analgesia is not discussed.

This volume is of great value to anesthesiologists who wish to refer their resident trainees to a comprehensive review of epidural analgesia.

Lt. Col. ROBT. E. LAU, U.S.A.F. (M.C.)

EMOTIONS AND BODILY CHANGES, A SURVEY OF LITERATURE ON PSYCHOSOMATIC INTERRELATIONS, 1910-1953. By Flanders Dunbar, M.D., Med.Sc.D., Ph.D.; Fourth Edition with Supplementary Material and Additional Bibliography. 1192 pages, including index, of which pages 753 to 1016 consist of bibliography. Columbia University Press, New York, 1954. Price \$15.00.

The original aim of the book has been admirably preserved in that an extensive bibliography has been accumulated, presented by both abstracts and references, and arranged in functional groupings according to focus. The collation of the material is of particular value.

The author's conceptual model of personality profiles in disease is résuméed in a table, opposite pages 746, entitled, "Personality Profiles of Eight Psychosomatic Diagnostic Groups." This is based on study of 1600 hospital admissions and plots fracture, coronary occlusion, hypertensive-vascular disease, anginal syndrome, rheumatic fever, rheumatic arthritis, rheumatic heart disease, cardiac arrhythmias and diabetes, against

family history, personal data, health record, injuries, general adjustment divided into six subheadings, characteristic behavior pattern, neurotic traits, addictions and interests, life situation immediately prior to onset, reaction to illness, and area of focal conflict and characteristic reaction.

The contents are divided into main sections on Orientation and Methodology, Organs or Organ Systems, Therapeutic Considerations, and Conclusion. It is impossible to report on the tremendous detail that is covered. The work is a standard reference and leisurely perusal is provocative of thought in very many areas. A separate chapter is entitled, "Problem of Measurement." In this, as in other portions of the book, considerable dissatisfaction is expressed with our instrument of measurement, particularly of things psychological, and even more with our inability skillfully to use instruments as we have. It is stated that the public is more aware of need for better public health than ever before, that there is considerable social pressure for better implementation, and that this calls for research which in turn calls for better research tools. With this, none can take exception. Offered solutions include (1) Painstaking descriptions of the techniques by which patients are cured and of the mechanisms revealed which lead to irreversible changes in both psychological and physiological spheres; (2) The reporting by psychiatrists in private office practice of the physiological and intercurrent illnesses of the predominantly psychiatric patient under treatment in correlation with the psychological aspects, and (3) Assuming skilled researchers from appropriate disciplines ". . . the part played by emotion in health and disease can be clarified and control method developed only through parallel, and, if possible, continuous, physiological and psychological studies of many individuals over a long period of time. It is chiefly on the basis of such studies that insight into the baffling problems of localization and duration of illness may be hoped for."

The final chapter of four pages of the text is labeled "Predictions have been substantiated." In 25 succinct numbered paragraphs an exposition is made that during the last two decades "the predictions made in the first edition of this book have been substantiated." The author takes some credit for the realization of the predictions and the reviewer feels that she is very modest regarding her tremendous contribution to the field of which she is both a pioneer and a leader.

All in all, this is a completely rewritten and up-to-date version of a standard work with which every physician should be familiar. Although the author arrives at certain conclusions, more often her formulations appear as comments and the final sentence of the book indicates that she regards her work as a preliminary step in the great field of human biology since the final answer is not yet and probably not even soon to be known. This volume is believed to be required reading for the physician.

COL. DONALD B. PETERSON, M.C., U.S.A.

TRANSACTIONS OF THE AMERICAN COLLEGE OF CARDIOLOGY, VOL. III—1953. Edited by Bruno Kisch, M.D., Robert P. Glover, M.D., and Ashton Graybiel, M.D. American College of Cardiology, 140 W. 57th St., New York 19, N.Y.

This paper bound volume presents the papers which were presented at the spring and fall sessions of the American College of Cardiology. The papers in the spring meeting were concerned largely with the diagnosis of heart disease whereas those of the fall meetings were concerned primarily with congenital heart disease.

Outstanding among the papers in the volume are the following:

Physiological Basis for Arterialization of the Coronary Sinus (Beck Operation) in the Treatment of Coronary Heart Disease, by Donald E. Gregg, M.D., Ph.D.

Who Is a Cardiac? by Walter S. Priest, M.D.

Differential Diagnosis of Heart Disease in Pregnancy, by Simon Dack, M.D.

The Diagnosis of Bernheim's Syndrome, by Henry I. Russek, M.D. and Burton L. Zohman, M.D.

Selection of Patients for Mitral Commissurotomy, by O. Henry Janton, M.D., Robert P. Glover, M.D., and Thomas J. E. O'Neill, M.D.

Congenital Cardiac Anomalies Associated with Mongolism, by Lotte Strauss, M.D.

Anatomic and Pathologic Considerations in the Surgical Treatment of Coarctation of the Aorta, by F. Henry Ellis, Jr., M.D., and O. Theron Clagett, M.D.

This book is recommended for the internist with special interest in cardiology.

COL. RYLE A. RADKE, M.C., U.S.A.

CARDIAC ANOMALIES—A CLINICOPATHOLOGIC CORRELATION. By Vincent Moragues, M.D., Associate Professor of Pathology, Creighton University School of Medicine,

and Chester P. Lynxwiler, M.D., Ass't. Professor of Pediatrics, St. Louis University School of Medicine. 92 pages, 157 figures. The Williams and Wilkins Company, Baltimore, 1954. Price \$6.50.

This book is a 92-page atlas of the common congenital cardiac anomalies designed as stated in the preface to "be of value not only to the medical student but to the pediatrician and general practitioner as well." Presented in outline form are the common congenital cardiac anomalies with the anomaly sketched, presented in gross specimen with X-ray, electrocardiograms and photomicrographs where indicated. A very brief statement regarding related laboratory findings, treatment and prognosis is then made. Its value to the audience for which it is intended is impaired by a failure to label the gross specimens clearly to identify the important points portrayed. Only the standard limb leads of the electrocardiogram are given again, decreasing the book's ability to teach. Presentation of the oxygen saturation and pressure data from the cardiac catheterization is not done but merely a summary statement made to indicate the results to be expected. In many of the photomicrographs, important details are obscured. This book has only its brevity and excellent line drawings to recommend it.

COL. RYLE A. RADKE, M.C., U.S.A.

PROFESSIONAL NURSING; TRENDS AND RELATIONSHIP. 5th Ed. By Eugenia K. Spalding, R.N., M.A., D.H.I., Professor of Nursing Education, Division of Nursing Education, Teachers College, Columbia University. 636 pages, illustrated. J. B. Lippincott Co., Philadelphia, Montreal, London, 1954. Price \$5.00.

This fifth edition of Mrs. Spaulding's book has been extensively revised and content added to reflect major trends and problems affecting nursing today. Even with the comprehensive expansion of this edition, no change has been made in the general philosophy and objectives of the first edition published in 1939. In bringing this book up to date, not only has the base of the content been broadened but emphasis has been shifted to trends, relationships and personal values.

The volume includes the introduction which deals with problem solving techniques and methods and four units—Social and Professional Outlook of the Nurse; Choosing a Field of Work and Succeeding in It; Professional Organizations and Activities; Other

Phases—Personal and Professional.

The breadth of the subject with its historical presentation and references makes it impossible to cover all subjects in detail.

Carefully selected problems are posed at the end of each chapter and the discriminately selected references of historical and current trend significance reflect the judgment and the tireless work of the author. The reader will be motivated to continuously add pertinent professional periodical references.

The chapter on nursing as a profession has been completely rewritten and incorporates William Shepard's criteria of a profession, introduction of nursing functions and brief consideration of graduate nurse education.

Effects of recent political, social, economic and occupational trends are reflected throughout the revisions of the unit on choosing a profession. Military Nursing is presented in Chapter 7, "Nurses in Public Service." The historical aspects are presented with up-to-date employment information and provides a clear picture of the many advantages and few disadvantages of professional nursing in the Federal Nursing Services.

Two new chapters have been added—"The National League for Nursing" and "Professional Nursing Journals in the United States." This information enhances the value of the book for all the readers for whom it was designed—students and graduate nurses.

The great number of professional people with such varied backgrounds of education and experience who gave suggestions on content, references and illustrations, attests to the fact that this volume was planned for and will serve the needs of a large professional group as a text book and as a reference book. Every freshman nursing student will find this book very valuable for the clear and understandable manner in which solving methods and techniques are presented, with practical visual aids as guides, and for the motivation and career purpose which she will get from unit one on social and professional aspects of the nursing field. Senior students and young graduates will want to own a copy, not only to assist them in making decisions regarding choosing their field of work but in guiding them in self-development, in giving leadership and in making a satisfying contribution when participating in professional and community organizations. The graduate nurse returning to nursing practice after a period

of absence will find this book very valuable and readily usable as a self-improvement tool.

MAJOR IDA G. PRICE, A.N.C., U.S.A.

TRANSFUSION SANGUINE ET ACTUALITÉS HÉMATOLOGIQUES. Published under the direction of Prof. Ed. Benhamon and Dr. Aud. Albou. 672 pages, 100 illust. Masson et Cie, Éditeurs, Paris, 1954. Price 4,000 fr.

This 672-page, paper bound volume (written in French) contains the most important papers presented before the First National Congress of Blood Transfusion of France and the French Speaking Countries in Algiers in April 1953. The volume has been divided into three parts. Part I is made up of 36 papers on the problems and recent advances in blood transfusion. These consider the civilian and military aspects of the transfusion of blood; blood groups and technics of transfusion, plasma preparation and electrophoresis. Part II is concerned with recent advances in hematology relative to red cells, white cells, platelets and blood coagulation. The third part contains a number of abstracts dealing with the importance of blood transfusion in medicine. This volume then presents a single source of current studies of many of our outstanding French investigators in the field of immunohematology, and is a valuable addition to one's bookshelf.

**LT. COL. JOSEPH H. AKEROYD,
M.S.C., U.S.A.**

LES PLAQUETTES SANGUINES DE L'HOMME. By Médecin-Commandant Bernard Maupin. 272 pages, 23 illust. Masson et Cie, Éditeurs, Paris, 1954. Price 2,000 fr.

This 272-page paper bound volume (written in French) presents a very thorough, up-to-date discussion of blood platelets of man, their enumeration and morphology, preparation and effectiveness in transfusion, their immunological properties, and studies on their chemical and physical properties. Chapter I presents a brief historical review of the early work with human blood platelets. Various technics of counting and separating platelets are given in careful detail in Chapter II. Chapter III reviews the concepts of the origin of blood platelets, their utilization and their survival *in vitro*. Morphological studies are covered in Chapter IV. The physical and chemical properties of the platelets and their role in coagulation are discussed in the next four chapters. The

current concepts of the immunohematology of those formed elements of the blood are presented in Chapter IX. The following two chapters are on the physiological and pathological variations of platelets, and their role in various disease entities. Chapter XIII deals with the technics of platelet transfusion and its therapeutic application. In Chapter XIV the author discusses the platelet as a viable cell. Each chapter has an extensive bibliography. This volume should serve not only as a reference for detailed methodology but also as a complete summary of our present knowledge of the human blood platelet.

Lt. Col. JOSEPH H. AKEROYD,
M.S.C., U.S.A.

DIAGNOSTIC LABORATORY HEMATOLOGY. By George E. Cartwright, M.D., Associate Professor of Medicine, University of Utah. 104 pages. Grune and Stratton, New York and London, 1954. Price \$3.00.

Here is a manual which concisely presents enough essential information so that a student or physician can perform and evaluate common laboratory procedures necessary to diagnose various blood disorders. In each instance only one technic is given, based upon its simplicity, reliability, time of performance, etc. Thus these tests can well be performed in the physician's office. Examinations dealing with the various aspects of blood counting, the coagulation of blood, hemolysis and the examination of bone marrow are described. Included also are technics for the examination of blood, urine and stool pigments that are related to hemoglobin. The appendix has a timely section on preparation of reagents. This manual should prove especially valuable to interns, residents and practicing physicians. Laboratory technicians will find it helpful.

COL. H. P. MARVIN, USA, RET.

DIAGNOSIS AND TREATMENT OF THE ACUTE PHASE OF POLIOMYELITIS AND ITS COMPLICATIONS. Edited by Albert G. Bower, A.B., M.D., FACP, Clinical Professor of Medicine, University of Southern California; Clinical Professor of Medicine, College of Medical Evangelists; 14 noted physicians as contributors. 250 pages; 64 figures. The Williams and Wilkins Company, Baltimore, 1954. Price \$6.50.

The contributing authors of this book, with 3 exceptions, are on the staff of the Communicable Disease Unit of the Los Angeles County Hospital, second largest communicable disease hospital in the United

States. This book is a candid, lucid expression of their experience in working as a group in the treatment of 17,000 poliomyelitis patients in the past 25 years.

The total care of all poliomyelitis cases is admittedly not fully covered, since it is not the intent of the editor to consider the treatment of the mildly involved or the chronic poliomyelitis patient. Special emphasis is given to the seriously ill patient with respiratory problems. Discussion of the diagnosis and treatment of poliomyelitis by combined medical, mechanical, operative and support methods is the high light of the book.

The outstanding impression left after review of this book is the remarkable variety and complexity of the apparatus and pooled resources needed for the adequate management of this disease, and the large number of specialists in medicine and surgery who should be concerned with different phases of management as members of the treatment team.

A natural sequel to this method of composition, and it is not major, is that most of the chapters are complete in themselves as if they were written as separate papers. This results in some duplication, which is not objectionable.

The book represents a worthwhile addition to medical literature and will be valuable as a reference for anyone who is interested in the treatment of poliomyelitis. It partially fills a long felt need for a text covering these aspects of the treatment of this disease. The editor states, "The aim of this book is to make available to the medical practitioner an outline of ready reference for the treatment of acute anterior poliomyelitis." This contribution to the management of a thus far unconquerable disease should aid materially in accomplishing this aim.

Lt. Col. JOHN H. KUITERT, M.C., U.S.A.

SURGERY OF THE CAECUM AND COLON. By Stanley Aylett, M.B.E., M.B., B.S., F.R.C.S., Surgeon, the Westminster Hospital Teaching Group, London. 295 pages, 142 figures. E. and S. Livingstone, Ltd., Edinburgh and London, 1954. Price \$9.00.

The author, a Teacher in Surgery, University of London, states that his book is the first English publication limited to surgery of the cecum and colon, which he feels is in the province of the general surgeon. Chapter One discusses surgical anatomy and physiology, including the process of rotation; Chapter Two covers pathology of tumors, their stages and classifications. The author

then discusses various disease entities with comments on surgical management which frequently are at variance with accepted practice or trends in America; for example, side to side anastomosis is recommended; extraperitoneal closure of colostomy is advised; in ulcerative colitis he recommends primary ileostomy with subsequent abdominal colectomy and iliosigmoidostomy, feeling that rarely is it necessary to remove the rectum. He recommends a multiple stage type surgical attack. In sigmoid volvulus, he prevents recurrence by suturing the apex of the loop to the abdominal wall, and uses the same type procedure in volvulus of the cecum. In wounds of the cecum he advises exteriorization plus a side to side ileotransverse colostomy. The bibliography is good and drawings are clear.

COL. WARNER F. BOWERS, MC, USA

SANDOZ ATLAS OF HAEMATOLOGY. 2nd Ed.
By Dr. E. Undritz of the Sandoz Pharmaceutical Research Laboratories, Basle, Switzerland, under the direction of Professor E. Rothlin, Professor of Medicine, University of Basle, Switzerland. 91 pages, 44 color plates. Sandoz Blood Atlas, 68 Charlton Street, New York 14, New York. Price \$7.00.

The first edition of "Sandoz Atlas of Haematology" was published in 1949 in French and German only. This second edition is also published in Italian and English and includes 70 additional color photographs.

The atlas is printed in loose leaf notebook style on pages 8½ x 11 inches. It is divided into three parts. Parts one and two are bound separately and can be removed from the loose leaf binding as units. Part three consists of 44 color plates with descriptive captions on facing pages. The color plates comprise a total of 256 color photomicrographs of normal and abnormal elements found in the blood and haematopoietic organs. The pages of part three are not bound together.

Part one includes a brief discussion of the terminology and classification of blood cells and an account of their formation, maturation, functions and destruction under normal and abnormal conditions. The authors subscribe to the theory that each species of blood cell in the adult organism arises from its own stem cell rather than, as in the embryo, from a multipotent mesenchymal cell.

Part one also includes a section on the technic of blood and bone marrow exami-

nation in which are given the various staining techniques, tables of normal values and forms for reporting examinations.

Part two includes detailed descriptions of the various cells seen in the blood and bone marrow in health and in disease. Differential features of cells are summarized in tables and reference is made to the appropriate color illustration. In addition to cellular elements, there are also descriptions and illustrations of various blood parasites.

Part three comprises the color illustrations with captions. All illustrations are photomicrographs of actual blood or bone marrow preparations. The magnification is 1:1200. The photographs are excellent in all respects. Color reproduction leaves nothing to be desired and every detail is easily seen. The preparations from which these 579 photographs were made are splendid examples of the art of staining.

This volume will be found useful by all who prepare and examine blood and bone marrow preparations. The wealth of illustrations together with easily understood descriptive data will be of great assistance in the recognition of the various cell types seen in health and in disease.

COL. HUGH R. GILMORE, JR., MC, USA

HYPERTENSION, CIBA FOUNDATION SYMPOSIUM—HUMORAL AND NEUROGENIC FACTORS. Editors for the CIBA Foundation: G.E.W. Wolstenholme, O.B.E., M.A., M.B., B.Ch. and Margaret P. Cameron, M.A., A.B.L.S.; assisted by Joan Etherington. 293 pages. Little, Brown and Company, Boston. 1954. Price \$6.75.

This book contains the proceedings of the symposium on hypertension sponsored by the CIBA Foundation in London, England, on 27th-30th July 1953. In all, there are twenty-three papers by prominent investigators and clinicians working in the field of hypertension. Eighteen of the papers are followed by open, frank discussions of the subjects reported upon. The authors, who gathered from all over the world, discuss the neural and humoral controls of the circulation, expounding their theories, expressing their views, reporting their experiments, their investigations, their current interests and their aspirations. The role of the ganglionic blocking agents, vasoconstrictor substances, renal corticectomy, electrolytes and the kidney in experimental hypertension are some of the subjects discussed. Several papers give considerable attention to the importance of so-

dium chloride and its ions in the production and treatment of hypertension. Clinical material is presented as well. The volume is interesting, stimulating and informative. It makes one feel, after reading it, that he is well versed in the latest advances in the knowledge of humoral and neurogenic factors in hypertension.

Lt. Col. FRANK A. Goss, USAF (MC)

ANATOMY, REGIONAL AND APPLIED. By R. J. Last, M.B., B.S., F.R.C.S., Professor of Applied Anatomy, Royal College of Surgeons of England. 665 pages, 309 illustrations, many in color. Little, Brown and Company, Boston. 1954. Price \$10.00.

To the uninitiated, and particularly to the first year medical student, the acquisition of anatomical knowledge by memorizing endless pages of large epitomes on anatomy is an undertaking of major proportions. So frequently this introduction to anatomy, although superficially successful in preparing the undergraduate for examinations, leaves him bewildered and inadequately prepared for the application of this knowledge in relation to surgery and other specialties in medicine. In keeping with improvements in medical education, there has evolved a realization of the need for a knowledge of functional anatomy, and most medical schools today approach the teaching of anatomy to the undergraduate in this fashion.

The author of this excellent manuscript, having served for many years on the examining boards of anatomy and physiology in England, has developed a rare insight into the requirements of the post-graduate in preparing himself for the specialty boards. The author has undertaken, therefore, to present in a succinct manner a compendium of anatomy based on functional aspects in its application to medicine and surgery. With the thought that anatomy can be learned and applied only if it is understood, he approaches his subject matter on the basic principles of *embryology*, how structures develop, *phylogeny*, how the structure evolved, and *physiology*, the manner in which structures function. In preparing this book, the author has incorporated some of his original work in anatomy, such as the function and movement of the menisci, the functions of the intrinsic muscles of the larynx and muscles of the mandible and floor of the mouth.

The contents of the book are divided into anatomical regions, such as The Thorax, The Lower Limb, The Abdomen, and The Head

and Neck. In the discussion of the various regions of the body, he has excluded much detail and attempted to present only that part of anatomy which is frequently used by the student and clinician. In so doing, he has enriched his text by presenting simply and practically developmental phases of anatomy which are applicable in the daily practice of medicine. As an example, the understanding of the rotation of the midgut, foregut and hindgut is of infinite practical value to the abdominal and pediatric surgeon. This subject is admirably described and illustrated in this book. This volume is well illustrated throughout by both line drawings and color plates.

For the busy clinician, surgeon or orthopedic surgeon who is preparing for his "boards," this book should provide an excellent basis for a review of anatomy. For the student and the resident, the contents of this book should fulfill the author's purpose in providing a better understanding of regional and applied anatomy.

COL. DOUGLAS B. KENDRICK, MC, USA

THE KIDNEY. A Ciba Foundation Symposium arranged jointly with the Renal Association. Edited by A. A. G. Lewis, B.Sc., M.D., M.R.C.P. and G. E. W. Wolstenholme, O.B.E., M.A., M.F., B.Ch. 333 pages. Little, Brown and Co., Boston. 1954. Price \$6.75.

This three hundred twenty page volume will prove valuable to everyone interested in the physiology and pathology of the kidney. The book is unique in that it is a verbatim account of the proceedings of an International Symposium on The Kidney held in London, in July, 1953.

The subject material includes structural and functional relationships in the kidney; the regulation of acid-base balance; tubular functions other than the regulation of acid-base balance; electrolyte excretion; and the renal share in the volume control of body fluid.

One hundred twenty illustrations serve to facilitate understanding and assimilation of this excellent material.

Lt. Col. WILLIAM A. COLLINS, JR.,
MC, USA

HERNIA: THE PATHOLOGIC ANATOMY OF THE MORE COMMON HERNIAS AND THEIR ANATOMIC REPAIR. By Chester B. McVay, M.D., Ph.D., Clinical Professor of Surgery and Associate Professor of Anatomy, University of South Dakota. 40

pages, with 19 plates. Charles C Thomas, Springfield, Ill. 1954. Price \$4.75.

This short monograph is very readable and excellently illustrated. As the author states in his introduction, he makes no attempt to show any operations for the various types of hernia, except those which he uses himself. He, therefore, gives no quotations from the literature. Nor does he mention any of the operations which have for a couple of generations been considered standard operations in inguinal hernia repair. Approximately half of the monograph is devoted to the consideration of hernias in the inguinal region.

The author is an excellent anatomist but it seems to this reviewer that he has allowed his knowledge of anatomy to bias his views on the surgical repair of hernia. His ideas on hernia repair might be called "fixed," because apparently he has a standard operation which he invariably uses for each type of hernia. This does not seem a good idea considering the well known fact that the anatomy of normal individuals varies greatly between one and the other, and the abnormal anatomy of hernial areas is even more variable. Therefore, most surgeons vary their operation to suit the anatomy of the particular patient being operated upon. The late Dr. J. M. T. Finney was often heard to say "Make your operation fit the patient. Don't try to make the patient fit your operation."

The author states that the solution to the large incisional hernia problem is abandonment of the vertical rectus incision. This is open to question in the minds of most surgeons because a great many surgeons employ both the vertical and transverse incisions, depending on the situation confronted at the same time of operation. A recent study showed the incidence of hernias in transverse and vertical abdominal incisions to be about equal. If the tissues of the patient are strong and the closure is carefully made, good results can, and have for many years, been obtained with both types of incision. If the patient's tissues are poor, herniation is apt to follow either type of incision.

The author states that the use of the inguinal ligament as an anchoring structure in groin hernias has no factual anatomic basis. Only a small percentage of the leading surgeons in the country will agree with this.

Again the author states that "A femoral hernioplasty is one of the most satisfying of all hernia operations in the groin because there is no shortage of aponeurosis and usually the posterior inguinal wall is a heavy aponeuroticofascial layer. The relaxing in-

cision is not necessary." This statement is in sharp disagreement with the experience of the present reviewer, who has found femoral hernias (especially those which have been operated upon several times before) to be among the most difficult hernias to cure, there often being a remarkable dearth of available fascial and aponeurotic structures with which to make the repair. When such a situation is encountered, relaxation incisions and every other means available to the surgeon are necessary in order to effect a satisfactory closure. Such supplementary materials as tantalum gauze and cutis grafts are also valuable aids in these cases.

There are minor points upon which disagreement might be found, such as preserving the umbilicus in the operation for large umbilical hernias in adults. The average surgeon is glad to excise the umbilicus with the surrounding skin right at the outset of this operation, removing it as a possible source of contamination during the operation, as it is obvious that, due to the wrinkled and folding skin forming it, it cannot be gotten as surgically clean as one would desire. Very few surgeons either would agree with the author's advocacy of the abdominal approach in the repair of diaphragmatic hernias.

In spite of all these disagreements it is felt that this monograph is a very stimulating one and should be read by all those surgeons who are especially interested in the hernia problem.

AMOS R. KOONTZ, M.D.

ESSENTIALS OF MEDICINE. 17th Edition. By Charles Philips Emerson, Jr., A.E., M.D., Associate Professor of Medicine, Boston University School of Medicine; and Jane Sherburn Bragdon, B.S., R.N., Associate Director, School of Nursing, Massachusetts Memorial Hospitals and Clinical Assistant in Medical and Surgical Nursing, Boston University School of Nursing, 922 pages. J. B. Lippincott Co., Philadelphia and Montreal, 1955. Price \$4.75.

Thirteen units presented by the authors give real meaning to the title "Essentials of Medicine" and its value as a textbook for the student and reference book for the graduate professional nurse.

While much of the basic structure of the previous edition has been retained, material within the framework has been rearranged and supplemented with or supplanted by new material. New chapters have been added and the scope of the text extended by Unit Thirteen, "Nursing in Disaster."

Among the 249 illustrations are 75 new photographs to assist the nurse in her role of clinical observer and recorder and to demonstrate certain nursing procedures applicable to care of patients in the home as well as in the hospital. In presenting procedures the emphasis on principles has been preserved.

The instructor and the instructed will find an excellent device for stimulating discussion on nursing care, appearing at the end of each Unit entitled "Nurse and Patient."

The material is organized and presented concisely and gives maximum benefit in minimum time. The up-to-date references and suggestions opens vistas for further research and investigation.

LILLIAN M. ADAMS, R.N.

SURGICAL NURSING. 10th Edition. By Eldridge L. Eliason, A.B., M.D., Sc.D., F.A.C.S.; L. Kraeer Ferguson, A.B., M.D., F.A.C.S., and Lillian A. Sholtis, R.N., B.S., M.S. 754 pages, 329 illustrations. J. B. Lippincott Co., Philadelphia and Montreal, 1955. Price \$4.75.

Although this book is designed primarily as a text for the nursing student, it is recommended highly as a source book for all nurses.

The material is presented in sections according to the functional divisions of the body. Each section stresses the principles involved in the care of patients before and after surgery; emphasizes the patient as a person with a surgical disease; and covers the how and why of methods in a concise and comprehensive manner. An excellent bibliography follows each section and selected clinical situations with germane questions direct thinking toward teaching and rehabilitation of the patient.

The general nature of the information given, the organization, index, glossary of combining forms, prefixes and suffixes, and the graphic use of illustrations add immeasurably to the volume's usefulness as a reference and guide.

CAPT. HELEN M. ELY, ANC.

FLUID AND ELECTROLYTES IN PRACTICE. By Harry Statland, M.D., Associate in Medicine, University of Kansas School of Medicine; Consultant in Medicine, Veterans Administration Hospital, Kansas City, Mo. 205 pages. J. B. Lippincott, Philadelphia, Montreal, London, 1954. Price \$5.00.

This book is a practical guide to fluid and electrolyte therapy. Part One deals with the

basic principles of fluid movements and the major abnormalities of volume, concentration and acid base balance. Part Two is directed to the management of specific diseases.

Although somewhat oversimplified, this book should be most useful to the busy practitioner in handling conditions in which fluid balance presents problems. The language is straightforward and the examples quite clear.

COL. CHARLES C. CANADA, MC, USA.

REGIONAL ENTERITIS, DIAGNOSTIC AND THERAPEUTIC CONSIDERATIONS. By Frederick F. Boyce, M.D., Professor of Clinical Surgery, Tulane University of Louisiana School of Medicine, New Orleans. J. B. Lippincott Co., Philadelphia and Montreal, 1955. Price \$2.35.

This 82-page monograph contains material originally published in the American Practitioner and Digest of Treatment, September 1954. It is a concise, clear and succinct presentation of available data on the challenging disease, regional enteritis. The illustrations are adequate, the printing excellent and the format pleasing.

The author reviews the literature, presents personal cases and discusses the conflicting data with restraint. This book is recommended for the internist, surgeon and general practitioner interested in gastrointestinal disease.

COL. RYLE A. RADKE, MC, USA.

HANDBOOK OF TREATMENT. By Harold T. Hyman, M.D. 511 pages. J. B. Lippincott Co., Philadelphia and Montreal, 1955. Price \$8.00.

This reference book on medical therapy is complete, yet concise, with a very effective format in which the subject matter is arranged in alphabetical order. Each disease or subject is headed by a brief paragraph on "General Principles" which includes mention of important signs, symptoms and other pertinent information. Then a paragraph on "Immediate Care" is followed by one on "Continuing Care" in the event of both favorable and unfavorable progress of the condition under treatment. Drugs are listed alphabetically according to "U.S.P.", "N.F." and "N.N.R." approved designations, followed by the drug manufacturer's name, trade name, pharmaceutical form in which dispensed and recommended dosage. Tabulated data are wisely utilized for many group subjects such as Adrenergens, Antigens, Malaricides, Narcotics and Antibiotics. The author adds his own helpful comment on certain subjects under a "Notes on the Chart"

heading. The index is especially detailed and complete. This book is highly recommended to general practitioners, residents, and all physicians interested in a very practical "Handbook of Treatment."

COL. H. P. MARVIN, USA, RET.

DRUGS IN CURRENT USE, 1955. Edited by Walter Modell, M.D., F.A.C.P., Associate Professor, Clinical Pharmacology, Cornell University Medical College. Springer Publishing Co., Inc., New York. 1955. Price \$2.00.

This is a 147-page, paper-bound volume. It is a compact book, listing drugs alphabetically. There is a good cross reference and drugs are listed either by the trade name or the chemical name. Synonyms are given where applicable. Generally, each drug is listed by its physical properties, actions and uses, administration, dosage, and the type of preparation commercially available. Where indicated, the antidote is listed. The author has inserted brief statements of warning where appropriate, giving the side effects and has included deterioration where indicated. That is a particularly valuable paragraph in most places. Under the antimalarial compounds, primaquine is not included. There is no limitation on the amount of dextran to be administered safely, although the author does make the precaution that this is a relatively untested material. There is no index; one is not necessary with the format used. The author accomplishes his purpose in listing the drugs currently in use and incorporating the essential information in abbreviated form. The book is a handy, up-to-date office reference which can be utilized, not only by the physicians, but by other professional personnel as well.

COL. FRANCIS W. PRUITT, MC, USA.

DIAGNOSTIC ADVANCES IN GASTRO-INTESTINAL ROENTGENOLOGY, SELECTED METHODS, WITH CLINICAL EVALUATION. By Arthur J. Bendick, M.D., Director of Radiology, Beth Israel Hospital, New York. 131 pages, 75 illustrations. Grune and Stratton, New York, and London, 1954. Price \$6.00.

In the preface, the author explains that: "This book is not intended for beginners. It is more suited for those Radiologists and Gastro-enterologists who have been making X-ray examinations for several years, yet are so situated that they cannot keep up with all the new techniques or the more modern interpretations of roentgen findings."

The first chapter deals with advances in X-ray equipment. The author stresses the application of "spot-filming." He describes a mobile cabinet, lead protected on top and three sides and having two shelves; one for unexposed films; the other for the exposed films; this cabinet being recommended for convenience to the radiologist in proceeding with roentgenoscopy and spotfilming.

Throughout the text, there is emphasis and re-emphasis relative to the attributes of mucosal studies such as accomplished particularly with the use of club soda following the intake of the very slight amount of barium. The value of these studies is stressed particularly in connection with examination of the stomach but also in connection with various aspects of study of the esophagus; in particular, where there might be equivocation as regards a possible small hiatal herniation. Likewise, double contrast visualization afforded by this means is keyed in connection with the diseases of the duodenum.

Chapters are devoted to lesions of the small intestine and also of the colon. Developments with respect to studies of the gall bladder and hepatic system include the use of Cholografin. Otherwise, the conventional cholangiogram is described. Mention of indirect visualization of the pancreas as provided with the club soda technique is stressed as an important innovation. To further stress the author's enthusiasm relative to utilizing air or gas content in the viscera, a short chapter is provided in connection with roentgen examination of the newborn where diagnosis is largely dependent upon such outlines.

This relatively brief text does provide interesting reading particularly in so far as the convictions of the author are concerned. COL. A. A. DE LORIMIER, MC, USA, RET.



NEW BOOKS

Year Book of Drug Therapy, edited by Harry Beckman, M.D. Year Book Publishers, Inc., Chicago 11, Ill. Price \$6.00. *The Tubercle Bacillus in the Pulmonary Lesion of Man. Histobacteriology and its Bearing on the Therapy of Pulmonary Tuberculosis*, by Georges Canetti, M.D., Director of Laboratory, Pasteur Institute, Paris, Foreword by Rene J. Dubos and Walsh McDermott, M.D. Springer Publishing Co., Inc., New York, N.Y. Price \$8.50.

Should the Patient Know the Truth? A response by physicians, nurses, clergymen, lawyers. Edited by Samuel Standard, M.D. and Helmut Nathan, M.D. Springer Publishing Co. Inc., New York, N.Y. Price \$2.50.

An Outline of the Treatment of Fractures, by the Committee on Trauma, American College of Surgeons, 1954, 5th ed. Chicago Ill.

Early Care of Acute Soft Tissue Injuries, by the Committee on Trauma, American College of Surgeons, Chicago, Ill.

A Manual for Training the Disabled Home-maker, Rehabilitation Monograph VIII, by Howard A. Rusk, M.D., Edith L. Kristeller, M.D., Julia S. Judson, M.S., Gladys M. Hunt, R.N., and Muriel E. Zimmerman, O.T.R. New York Univ.-Bellevue Medical Center, New York 16, N.Y. Price \$2.00.

Segmental Anatomy of the Lungs, by Edward A. Boyden, Ph.D. (Med. Sc.) Blakiston Division, McGraw-Hill Book Co. Inc., New York, N.Y. Price \$15.00.

Principles of Internal Medicine, in two volumes, edited by T. R. Harrison, 2nd ed. Blakiston Div., McGraw-Hill Book Co. Inc., New York, N.Y. Price \$21.00.

Advanced Surgery of Cataract, by Daniel B. Kirby, M.D. J. B. Lippincott Co., Philadelphia, Pa. Price \$27.00.

Analytical Cytology, edited by Robert C.

Mellors, M.D., Ph.D. McGraw-Hill Book Co., Inc., New York, N.Y. Price \$15.00.

Surgery of the Face, Mouth, and Jaws, by Frank McDowell, M.D., James B. Brown, M.D., and Minot P. Fryer, M.D. The C. V. Mosby Co., St. Louis, Mo. Price \$6.50.

Principles of Hospital Administration, by John R. McGibony, M.D. Physicians' Record Co., Chicago 5, Ill. Price \$6.50.

Poliomyelitis. World Health Organization Monograph Series No. 26. Columbia University Press, New York, N.Y. Price \$8.00.

Ion Exchange and Adsorption Agents in Medicine. The Concept of Intestinal Bionomics, by Gustav J. Martin, Sc.D. Little, Brown & Company, Boston, Mass. Price \$7.50.

American Military Policy. Its Development since 1775, by C. J. Bernardo and Eugene H. Bacon. The Military Service Publishing Co., Harrisburg, Pa. Price \$5.00.

The Human Machine, by Capt. Charles W. Shilling, MC, USN. United States Naval Institute, Annapolis, Md. Price \$5.00.

The Army Air Force in World War II, Vol. VI—Men and Planes, Edited by W. F. Craven and J. L. Cate. The University of Chicago Press, Chicago 37, Ill. Price \$8.50.

Clinical Disorders of Hydration and Acid-Base Equilibrium, by Louis G. Welt, M.D. Little, Brown & Co., Boston 6, Mass. Price \$6.00.

Fluoroscopy in Diagnostic Roentgenology, by Otto Duetschberger, M.D. W. B. Saunders Co., Philadelphia, Pa. Price \$22.00.

Any of the above books may be ordered through the Association of Military Surgeons. Check book desired, and return this page

The Sir Henry Wellcome Medal and Prize

COMPETITION FOR 1955

THE competition is open to all medical department officers, former such officers, of the Army, Navy, Air Force, Public Health Service, Veterans Administration, The National Guard and the Reserves of the United States, commissioned officers of foreign military services, and all members of the Association, except that no person shall be eligible for a second award of this medal and prize and no paper previously published will be accepted.

The award for 1955, a medal, a scroll, and a cash prize of \$500, will be given for the paper selected by a committee composed of the Association's vice-presidents which reports on the most useful original investigation in the field of military medicine. The widest latitude is given this competition, so that it may be open to all components of the membership of the Association. Appropriate subjects may be found in the theory and practice of medicine, dentistry, veterinary medicine, nursing and sanitation. The material presented may be the result of laboratory work or of field experience. Certain weight will be given to the amount and quality of the original work involved, but relative value to military medicine as a whole will be the determining factor.

Each competitor must furnish six copies of his paper which must not be signed with the true name of the author, but are to be identified by a *nom de plume* or distinctive device. These must be forwarded to the Secretary of the Association of Military Surgeons of the United States, Suite 718, 1726 Eye St. N.W., Washington 6, D.C., so as to arrive at a date not later than 1 August 1955, and must be accompanied by a sealed envelope marked on the outside with the fictitious name or device assumed by the writer and enclosing his true name, title and address. The length of the essays is fixed between a maximum of 10,000 words and a minimum of 3000 words. After the winning paper has been selected the envelope accompanying the winning essay or report will be opened by the Secretary of the Association and the name of the successful contestant announced by him. The winning essay or report becomes the property of the Association, and will be published in *MILITARY MEDICINE*. Should the Board of Award see fit to designate any paper for "first honorable mention" the Executive Council may award the writer life membership in The Association of Military Surgeons, and his essay will then also become the property of the Association.

